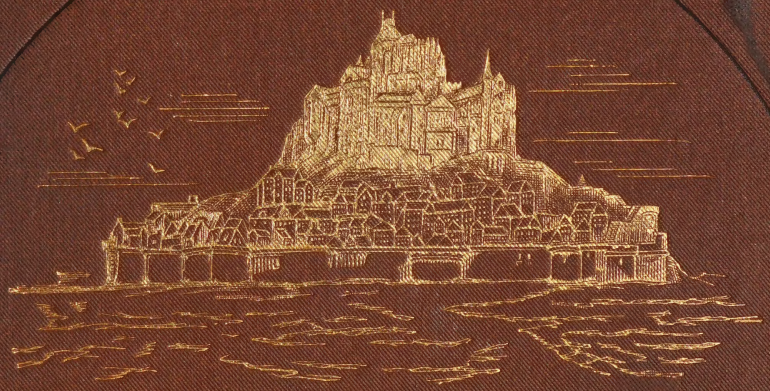
A Farmer's Vacation



George E. Waring Jr.

Illustrated

A

FARMER'S VACATION.

BY

GEORGE E. WARING, JR.,

OF OGDEN FARM.

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Illustrated.

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GEORGE E. WARING, JR.

TO

COLONEL SIR JOHN LE COUTEUR,

OF BELLEVUE, JERSEY,

AND

MR. J. W. M. VAN DER POLL,

DIJKGRAAF HAARLEMERMEERPOLDER.

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The papers here collected are notes of a trip through some of the Netherland Provinces, parts of Normandy and Brittany, and the Channel Islands, made in August and September, 1873.

A FARMER'S VACATION.

CHAPTER I.

HOLLOW-LAND.

WE had stopped to change coaches at the hamlet of Bunde, near the Dutch border of East Friesland, and to take our last glass of German beer in the little parlor of the Post-house, where a few Dutch ornaments had crept in among the more familiar forms.

A vehicle of a new shape drove up, the mails and luggage were loaded, we climbed to the narrow seats of the half-open interior, the horn tooted, and away we rattled over the brick pavement that wound through the village and out into the flat open country, between roadside ditches nearly filled with water. Presently we drew up, under the raised bar in front of a wayside custom-house. The examination of baggage was soon made, and we clattered on into the Kingdom of the United Netherlands, — which we entered by its back door. Instantly the aspect of the country changed, and we realized the presence of the transforming hand of the Dutch Wizard of Drainage.

In East Friesland the ditches had been full nearly to the brink, vegetation showed the ill effect of a wet soil, and there was a general air of swamp and fog over the land and its people. Here, the water was three or four feet below the surface, the land was dry, the growth was magnificent, and, though the country was flat as the sea, there was no suspicion of wetness anywhere. The few people whom we met were hardy and red-cheeked. The farm-houses and barns grew larger, and hay and grain ricks multiplied. Perhaps nowhere else in the world is such

a sudden change of condition, due entirely to art, to be seen in a country of precisely the same original character.

We soon reached the little walled village or fort of Nieuwe Schans. We had dismounted at a hotel, outside the fort, adjoining the post-station and overlooking a canal. It was raining and chilly, and the desolate house was mouldy, damp, and uncomfortable. There was no especially foreign air about any part of the establishment,—the same sort of discomfort is still to be found in the Dutch villages east of the Upper Hudson. Almost the only odd-looking thing was a tall stand filled with long clay pipes, suggesting the evening congregation of the men of the neighborhood. The landlord, already, at midday, well stupefied with gin, grumbled in his imperfect German about the dearth of good servants, and cooked for us, himself, an unsavory mess of fried beef and onions. During our short stay he paid frequent visits to the bottle-closet, and became more and more disconsolate.

In front of the house, moored to the shore, lay a canal-boat well stocked with crockery arranged for sale. The merchant and his family had their home in the cabin, and their kitchen and scullery on the quarter-deck. This was our first example of an institution peculiar to the Netherlands, where so much of the life is on the canals,—merchants of many sorts living and carrying on their traffic in canal-boats, moving from place to place in search of a market, and sometimes setting sail and standing for Amsterdam to replenish stock.

Canal-boat living is scrupulously cleanly, the abundant water at hand allowing the Dutch passion for scrubbing and scouring a field for its fullest sway. The narrowness of the quarters seems to be no inconvenience, much of the life being on deck. The occupations of these floating people appear exceedingly simple, the men smoking and the women knitting with faithful constancy.

After some hours' waiting for train-time, we started for the station, the landlord insisting on carrying our small hand-bag. But he was too far gone, and his oft-changed hands refused their grasp. He soon allowed me to

relieve him, — apologizing that it was an "ungewohnte arbeit," an unaccustomed work to which his sinews had not been hardened by use. He said he was of gentle blood, and offered as his maudlin proof a curiously ornamented old watch and chain of the sixteenth century, which had descended from his forefathers.

The railway from Nieuwe Schans to Groningen has been recently opened, and everything about the frequent stations is new and raw-looking, so that the impression the traveller gets is in one respect similar to that given by our own Western prairie regions; and the broad windy stretch of flat country, without much wood, and lying open to the gales of the North Sea, has a little of the same bleak, unhomelike air. But with this is mingled a most unaccustomed aspect of novelty. These fields are cultivated with the care of suburban market-gardens, and are separated by long straight V-shaped ditches, in which the water runs some feet below the surface of the ground. Looking across them, we see broad, dingy sails moving in various directions among the growing crops; the railway is on an embankment, and we are running well above the land; we frequently cross canals, lying far enough below us for the deck-loads and the lowered masts of the barges to pass under the road, without the need of drawbridges. Scattered over the whole landscape are the remarkable habitations of the farmers and their herds.

Many of these houses were near enough for us to examine them, others only suggestions of similar farmsteads far away over the wide plain. As well as we could judge, they were all of similar character, — large, handsome, three-story stone or brick houses, well built and substantial, with a hedge-like row of clipped trees along the front, — cut low to admit the sun to sleeping-room windows, — and, in front of these, neat gardens with good grass and showy flowers; running out from the back of the house, which its peak often overtops, and beyond which its low eaves project far on each side, is the huge red-tiled roof of the barn, — large enough for the complete housing of the crops of the farm, for the comfortable accommodation of all its live-stock, and for the sheltering of all implements. The evidences of wealth on every side, and the absence of all evidences

of poverty, suggest an unequalled richness of soil, no less than a most skilful and industrious people. It is a region fairly teeming with fertility, bustling with activity on land and water, and stretching its productive fields, one after another, to the far-away sand-dunes of the north coast.

As we neared Groningen — our first Dutch town — we were curious as to our accommodation and personal comfort. The guide-books made it seem a chief advantage of one of the hotels that we need not sleep on feathers, and confined its general information mainly to the statement that the city has a population of forty thousand (all Dutch, of course), is situated at the junction of two principal canals, and is an important Dutch seaport. Those who have been bred in America, with its generous cultivation of the instincts in favor of foreign (and especially of "Dutch") ways and doings, will understand that we were imbued with a proper superiority of feeling, and were prepared to accept the oddities and provincialisms of Groningen without severe criticism; to make the best of what it had to offer that was good or interesting, and to put up with or to disregard its shortcomings, — making due allowance for the disadvantages of a people who had been born Dutch. The strong infusion of Dutch blood in our own veins need not be considered, for we had that mysterious inner light that comes of American birth and education, and gives the look, from above downward, with which we so justly scrutinize the less favored civilizations of Europe.

This spirit had been shaken in some of our earlier experiences of travel, but nowhere had it been so chastened as it was at Groningen; and I meekly confess, at this point, that by the time we had crossed the Belgian frontier, some weeks later, it was entirely and forever laid.

A town of forty thousand inhabitants is not of itself remarkable. We have plenty such at home, but we have no small town at all comparable to Groningen in the evidences of good government and general refinement and cultivation. Much of its advantage is due to its great age, but more to the wise use of the means of improvement with which it has been blessed, and to the thrift and far-seeing intelligence of its people. The

approach from the station leads over a massive and well-shaded bridge that spans the moat-like canal, busy with moving craft, and through a handsome archway in the wall of the town. The well-kept and park-like walks outside the walls were frequented by well-dressed pleasure-seekers, and the whole scene at this point was no less charming than unexpected.

Within the walls we found a well-built city, much less strange to us than many towns we had seen, and, indeed, with an air very much like that of Philadelphia, — especially in its red brick and clean white doors and window-frames. While obviously old, it seemed to have always been thriving and well kept. The hotel was excellent, and the shops and private houses were often fine. This is the most important of the northern towns of the country. It has an excellent university, a museum of natural history, a botanic garden, institutions for the instruction of the blind and of the deaf and dumb, and a school of painting, sculpture, and architecture. The Breedemarkt is one of the largest *plazas* in the kingdom, and it is flanked by some very fine churches and public buildings. These details are mentioned, notwithstanding their guide-book air, because they are so entirely different from what we had an idea of finding, and as indicating the completeness with which we withdrew our estimate of what it must imply to be Dutch and to live in Groningen.

Yet, in spite of the modern air of the shops and of many of the houses, there was enough of novelty and quaintness in the life of the streets to attract the interest of the traveller. Opposite our window was a street pump, about which women and girls were constantly awaiting their turns to fill the pails that hung from their wooden neck-yokes. Here they stood chatting, heedless of the rain that was falling. Their stout woollen dresses were evidently used to it, and they themselves looked hearty enough to withstand any exposure.

Like all the women of their class whom we saw, — including the itinerant venders of milk and vegetables, — they had their heads done up after the marvellous fashion of their province. Whether they are a hairless race could not be told; but not a trace of hair was to be seen, nor did there seem room for tresses under their triple coifs, which consist of a

closely fitting cap of white cotton; another, equally close, of black silk; and over these a solid *plaque* of shining gold or silver, covering the whole head, save a small space at the crown, and a narrow slit at the top, "where got the apple in." The side wings reach nearly to the eyes, and they nearly join at the top of the head. They are quite as large as an ordinary pair of rounded horse's blinders; the band by which these are joined at the back is fully three inches wide.

HEAD-DRESS OF GRONINGEN PEASANT.

This is the head-gear with which the working-women turn out in the early morning, and in which they do their drudgery; but they are usually seen with the added decoration of engraved, or embossed, or filagree ornaments of the same metal, nearly two inches across, attached to the front of the plate, and making the effect of gold or silver rosettes just back of the eyes. It is a very undress occasion on which even this suffices; they usually wear a fourth covering of thin lace. This is a cap, drawn close over the forehead, and hanging in a full cape behind. The whole gold affair is covered, save the rosettes, but it still glints gayly through the slight tissue. The origin of this singular costume we had no means of learning. It is common in various provinces of the Netherlands, and is worn with pride by those who travel or reside in other than their native districts, — to such an extent that it attracts no attention in any part of the kingdom. In the streets of Amsterdam it is constantly seen. The first one that we saw did attract our attention, and we followed it curiously from under the moonlit old gateway of Embden, — with furtive inspection as it passed blazing shop windows. We gave it our sympathy as a case of severe trephining, remembering an uncle, a fleck of whose skull had given place to a silver plate.

We went to buy one of these gold plaques as a curiosity, and found to our surprise that they are made of pure metal, and cost a large sum. The cheapest gold one we found cost one hundred and ten gulden (fifty-

five dollars in currency). The silver ones are cheaper, but still very costly, for the daily wear of the kitchen. We found one at last of gilded brass, which cost but a trifle, but were told that no peasant-woman or servant-girl could wear it and preserve her self-respect.

Like all novelties, these head-dresses soon grew familiar, and, after devouring a few townfuls of them, we had no further appetite save for the ornaments at the temples, of which nearly every village has its own form, — some very curious. There is also some variety in the head-plates, but they are of the same general character.

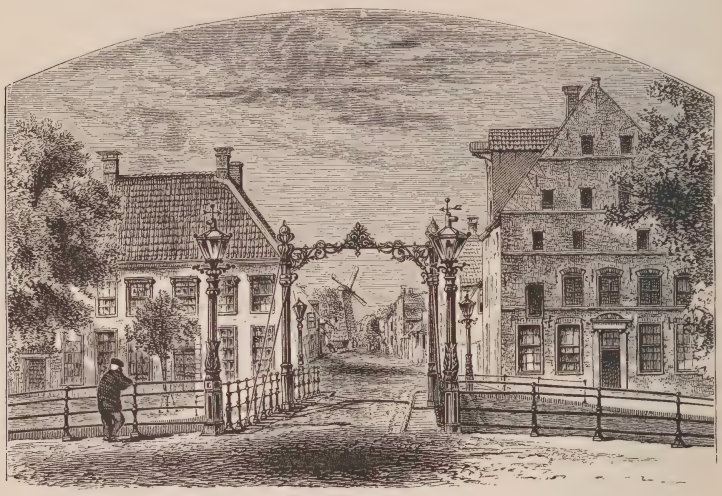
These shining metal heads, glittering through neat lace, are attractive for more than their novelty, and the gear is really becoming to the fair complexions and clear eyes of the damsels of the northern peninsula.

The fashions of Paris have penetrated even to Groningen, modifying the dress of all above the working-class, but they seem powerless before this national distinction. If the French bonnet is worn, as it sometimes is, it must adjust itself to this gilded ball of a head, without its accustomed cushion of false hair. In many localities the native costume included a hat of some remarkable cut, but usually where the metal plates are worn they are covered, if at all, only by the thin cap, through which they are plainly seen. The variety of detail is constant in the different regions. In the island of Ameland, in the North Sea, the plate is continuous over the head, the side ornaments look like curved shutters thrown open to show the temples, the cap is fastened on by gold-headed pins, and a little cluster of false curls is worn at each side.

HEAD-DRESS OF THE ISLAND OF AMELAND.

The principal part of Groningen is built on *terra firma*, but the outskirts are lower, and here the streets are divided by canals, which are busy with traffic. At the edges of the town there are many wind-mills, and the houses are more thoroughly Dutch than in the main business and residence streets.

Our route lay westward, to Leeuwarden, the capital of the province of Friesland. The character of the country traversed differed very little from that between Groningen and the German border. On every hand



A STREET IN THE EDGE OF GRONINGEN.

were the same evidences of activity on land and water, and of commercial and agricultural prosperity. It was harvest-time, and thick-standing gavels bespoke the richness of the ditch-bound fields. The same great farm-houses and barns, and the same sails among the meadows, were everywhere seen. Here, as in the other province, the cattle were superb and numerous.

Leeuwarden, which has a beautiful and well-kept park, we found much more peculiar than Groningen, and the evidences of its great age were more conspicuous. Yet, with all its age, it is emphatically a town of to-day; its old, ruined church-tower, which has lost its church, and which stood in the fierce times of the Spanish wars, and its quaint old streets, suggest all that could be desired of historic and picturesque interest, but the canals in its streets are busy with modern commerce, the shop windows are effective in their appeal to present wants, and an air of comfortable prosperity is everywhere prevalent.

This is the cleanest large town we have anywhere seen. We wan-

dered in the back slums, among people of the poorest class, and saw no spot that was not cleaner than Union Square or Fifth Avenue, in New York. Nor was this all, — the cleanliness extended to the people themselves. Hard-worked char-women, and the children playing in the alleys, were as trim and tidy as though dressed for school or church. Nor is even this all, — the politeness and grace of all classes of the people were most marked. At every turn we were greeted with cordial salutation, — really cordial. We were bid "Good Day," not apparently as a matter of form, but as though the speaker had an interest in our welfare. There was some curiosity evinced as to our queer costume, and a helmeted woman would now and then be called from a house to look at the unaccustomed head-dress of our ladies; but even this was as far as possible from rudeness.

The women of Friesland have a world-wide reputation for beauty, and the women of Leeuwarden must be of the fairest Frisian type. More striking maidens may be seen elsewhere, but the beauty of these is of a sort that seems never to fade; on the contrary, it often at least grows fresher and more delicate with advancing years, and to reach the culmination of loveliness in ripe old age, when the skin has a wax-like rosiness, the blue veins are clearly marked about the white temples, and the eyes remain pure and mellow. Fine foreheads, beautifully pencilled eyebrows, and delicate features are almost universal. There are gradations of comeliness, of course, and plain faces are not hard to find; but the average beauty, apparently without reference to class, is very striking. We bought currants from a woman of more than the allotted threescore years and ten, whose face would be a fortune to a belle.

Leeuwarden owes much of its obvious prosperity to the residence of capitalists, whose investments are in the fertile lands of Friesland, the farmers of this province being largely tenants. Rents are high and promptly paid, and the land-owners are the social nabobs of the town. That there are many men of leisure is evidenced by two modern club-houses, large and perfectly appointed, which we were surprised to find in so small a city.

A beautiful building is the Butter Market; of exquisite proportions,

old and well-built, of dark red brick, with facings of light stone. Its unobtrusiveness is one of its chief charms. It has a modest character, suited to its modest uses; but its perfectly artistic form and coloring are well worthy of the attention they are sure to engage. Here are kept the official scales, over which all butter exported or sold in the market must pass.

BOTER-MARKT AT LEEUWARDEN.

We were attracted by a small bit of old Delft ware in the window of a spectacle-maker's shop, and went in to examine it. It was a queer little shop, with many odd kickshaws which interested us, and the enthusiastic spectacle-man led us to an inner room, where he had a perfect museum of old Delft. We found his prices extravagantly high (as they were in all country towns, where we hoped to find them low), for the reason, as he told us, that he can at any time sell his whole stock to the Jew dealers at Amsterdam and the Hague at very high rates. The spectacle business was evidently only a tradition and a cloak; and after we had sufficiently admired the stock on the ground-floor, he drummed up his old wife with her keys, and led us up the narrow stairs to a wealth of wonderful bric-à-brac-rie, crowding two large rooms above.

Ancient brocades, old silver-ware of most exquisite design, and all manner of luxurious furniture, remaining from the wealthy generations that have gone, filled every corner and cranny. For the modest sum of three thousand gulden* we could have bought a marvel of a carved table of ebony and ivory of rarest workmanship, which had belonged to Prince Maurice; and for five hundred, an antique teapot of *repoussé* silver, such as no modern hammering seems able even to suggest. When we had returned to the street we looked back with amazement, to think that so modest a shop could be the entrance to such a store of riches.

Unfortunately, we had not known the interest of the country and the towns of Groningen and Friesland when we formed the plan of travel that hurried us on toward Amsterdam, and we had to cut short our visit and take the train for Harlingen on the Zuyder Zee. This is a dullish seaport, defended by enormous granite-faced dikes against the invasion of the sea, which entirely destroyed the town in 1134, and overwhelmed it again in 1566. Here we took the small steamer for Amsterdam. The wind was high, and the sea wide and rough. We bore down the low line of coast until we came abreast of Hindeloopen, whence a heavy open lugger put out to meet us with a fresh supply of passengers, who were handed up on the open guard beneath which the lugger was tossing. The one woman of the party wore the strange costume of her town.

COSTUME OF HINDELOOPEN.

* The gulden, which will be used throughout these papers on Holland, is about equal to fifty cents United States currency.

The wind was so fresh that few vessels were out, and these few were under close-reefed sail. The trip occupied six hours, and had the usual discomfort of rough weather and small tonnage.

After leaving the Frisian coast our course was toward a beacon rising out of the water, which, as we neared it, grew into a church-steeple. Gradually wind-mills and the roofs of houses were developed, and the old city of Enkhuizen stood out on the film of land that seemed but a continuation of the sea. The rest of our course was within sight of wind-mills, and generally of the land that supported them. Villages and churches were frequent, but the view was hardly inspiring, — gray sky and gray water were barely separated by the gray coast, and this had much the effect of a tight-rope, on which the houses and mills and trees were balancing themselves.

The low shore had little effect on the northwest wind; but the sea was much more quiet, and vessels became frequent. Some of these were square-rigged sea-going craft, but more were canal-boats, with their sails hauled down to the smallest capacity, and toiling along with an unaccustomed list, — women and children under close hatches in the cabin, and the men, clad in oil-skins and sou'westers, bracing themselves to their work on deck.

As we approached it, Amsterdam manifested itself by a thicker clustering of the universal wind-mills, and by the looming up of huge domes and church towers and steeples, and by a forest of topmasts reaching above the general level of the roofs.

It is one of the peculiarities of Holland that we go down into it from the sea, and the further in we go the deeper down we get. The metropolis lies on a river or estuary called (for short) the IJ.* Into this we entered through a ponderous granite-built lock, — one of an assorted series, of various sizes, adjusted to vessels of larger or smaller dimensions. After we had been shut into our compartment the valves were opened, and we followed the declining water until it reached the level of the IJ, when the gates were swung back and we steamed on to the city.

* Pronounced *Eye*.

And here we were in Amsterdam, — the mother of the "Nieuw Amsterdam" of Peter Stuyvesant and Wouter Van Twiller. The guide-books (to which the reader is respectfully referred) are fond of calling this town "the Venice of the North," which misleads the imagination. Like Venice, it, is built on piles, — Erasmus speaks of its people as living like birds perched on the tops of trees, — and some of its obscurer narrow alleys are only canals. Beyond this, the resemblances are only differences. The canals penetrate many of the principal streets, it is true, but these are wide thoroughfares, with broad, well-paved roadways and sidewalks, and often with four rows of trees, — the water-way being between the centre rows. Carriages and heavy drays are moving noisily in every direction, and the canals are but little used for internal traffic. Canal-boats, lighters, and in some parts even square-rigged ships, are floated opposite to the warehouses which are to receive or to deliver their cargoes; but the city has a roar and hum that would at once destroy the dreamy charm of Venice. A gondola would be as misfitting here as would a Bath-chair in Broadway.

There is much in Amsterdam that is magnificent, and in which we were greatly interested, but my present purpose lies mainly connected with those of its features which seldom engage the attention of travellers. Rising at daybreak, I strolled out to see the street life of the early morning. Market-men and market-women from the country, near and far, dressed in their widely varying local costumes, were plying their traffic in the streets and on the canals; and housemaids were scrubbing steps and sidewalks, and sweeping to the middle of the carriage-way, or hurrying home with prayer-book or market-basket. The town was alive with a population which a few hours later would make way for those who are known only to the broader day.

Canal-boats were arriving and departing; moving out from their berths through a crowd of other craft, with that mysterious kind of silent help that a moving canal-boat always gets from the crews of its neighbors at rest, — its sides prodded with boat-hooks from here and from there, as it slowly floats out from the crowd and starts on its way "sans mot

dire"; turf-boats were floating into the Dam Rak, furling their sails and lowering their masts; cargoes of cabbages were being tossed, one by one, from men in boats to men on shore; here the clatter of knives and forks was heard through low back windows and cabin-hatch, and here the vrouw was washing up the breakfast things in a slat-floored kitchen sink hanging from the taffrail; strange-looking people were doing strange-looking things throughout all the strange-looking fleet, and all with the air of its being in no wise unusual or peculiar. On shore, a street vender was attracting custom with a watchman's rattle; men were hoisting baskets of turf to the cellar, at the top of a high house gable; women and children were going from a basement with the sign "water en vuur te koop," with neatly painted iron buckets, each having a kettle of boiling water at the top, and a lump of burning turf at the bottom, — going home to make the morning tea; at every quarter-hour the carillon jingled from all the steeples. The gin-shops were already well patronized, for it seems a universal habit, in this moist northern climate, to take "een sneeuwballetje" * of gin and sugar as a frequent prophylactic. At this early hour, and about the canals, the gilded heads and odd bonnets of the peasant-women are more frequent than elsewhere, or later in the day.

Near the Haarlem Railway station I turned down by the broad canal that encircles the city, where there was a long line of huge wind-mills. The first was a saw-mill, carrying two gangs of fourteen saws each, and capable of sawing, with a good wind, two eighteen-inch logs at a time.

I next visited a flour-mill, of which the owner showed me all the details. The substructure was a large tower of brick, three stories high. On the ground-floor were stables, wagon-house, and storage-room for hay; over this, the granary and flour and meal store; and next, the bolting-rooms, where the ground wheat is divided into seven different qualities of flour and feed, which run through separate spouts to the store-room below. On the next floor were three runs of five-foot stones. In a full wind they may all be run at once. The stones have a regulator, which

* A little snowball.

sets them nearer together when running too fast, making more resistance to the wind. The general arrangement of the stones is the same as with us. There is a friction hoisting-gear in connection with the main shaft,

WIND-MILLS AT AMSTERDAM.

whereby, on the pressure of a lever, a wheel on the windlass is brought against one on the running-shaft, and the movement is communicated. By this means all grain to be ground is hoisted from the wagons, through traps in the several floors, to the story above the stones. Here the cleaning-machines are operated, and the different manipulations of grinding, bolting, and bagging accompany its descent, by spouts, from floor to floor. The wind-mill proper is quite above this structure, sheltering the upper floor, on which the cleaning-machines stand. It is, of itself, an enormous affair, and the immense tree-trunk of a main-shaft that was groaning with its strong slow movements far above us turned all the heavy machinery of the mill with its mighty force, and sent a

tremor through every window-sash. It was hard to realize that all this obvious power was gathered from the unseen air by the frail-looking frames that held the opened sails. In this mill, as in all the larger ones, a wide gallery surrounds the top of the brick tower for working the windlass, by which the hood and wind-wheel (main-shaft and all) are turned to face the breeze. The windlass is at the converging point of a framework that descends from the projecting timbers of the hood, and it carries a stout rope, the ends of which are hooked at different points of the gallery, as may be needed in facing toward different points of the compass.

Distance is very unjust to these higher wind-mills. It is only when one is fairly under their thatched covering, or close to their giant arms, that their size is at all appreciated. In the one I am describing, the gallery was more than forty feet from the ground, and the sweep of the sails described a circle of nearly one hundred feet diameter above this.

The whole of the sloping structure, above the brick-work, as well as the roof of the hood, was, according to the almost universal custom, covered with heavy straw thatch. This is always kept in neat repair, and never falls to the mossy and picturesque condition of decay which seems the allotted end of cottage thatches, but is kept sound and firm from generation to generation. The interior arrangements of the mill are exceedingly ingenious and practical, and showed a much higher degree of mechanical art than we are wont to connect with the idea of a Dutch wind-mill. I descended from my examination with slight disposition to explain to the friendly proprietor the modern contrivances of the newly built establishment in America, where I had once officiated as chief miller. I descended with another feeling also strong within me, — a realization of the enormous and easily managed power that we allow to blow where it listeth, and of which we make no useful account in our mechanical operations.

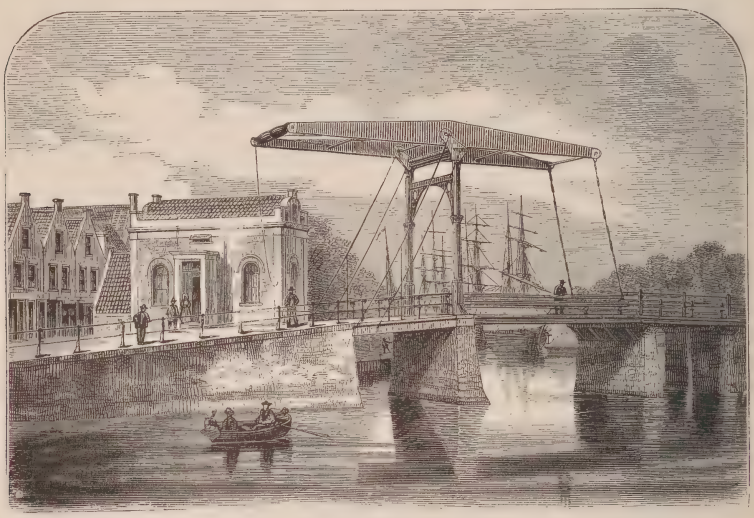
The canal-boats one sees in the street canals of Amsterdam, and all over Holland, are mainly of the same character, — shorter than ours, and all provided with mast and sail. They are not painted, but oiled, and

have a warm brown wood-color that is very agreeable. The mast is hinged at the deck, and is raised or lowered at pleasure, by means of a windlass. That part below the deck is heavily loaded with iron, as a counterpoise to the long end. When the top is lying back over the stern the counterpoise appears above the deck at the bow. When standing erect, the counterpoise is on the upper edge of the keel, and the step is held firmly in its socket by the bow-guy which is hauled taut by the windlass. The gaff at the top of the sail — there is often no boom below it — is not straight, but curved, and the pennant, instead of hanging free from the mast, is, for a part of its length, stretched on a stiff, vane-like frame, which turns on a rod, after the manner of a weathercock.

GAFF AND PENNANT OF A DUTCH CANAL-BOAT.

It is very rare to see one of these boats drawn by horses in the Netherlands. The propulsion is generally by the wind; when this fails, or is too much ahead, the family turn out, shoulder the guy-rope, and trudge slowly along the tow-path. Often father, mother, and children are seen pulling their craft for miles along their sluggish way, one remaining at the helm to keep the course. Where the tow-path fails, as it often does, and in the street canals of the town, the man on one side of the deck and the woman on the other, planting their long boat-hooks against the bottom, bear a shoulder against the other end (padded for the purpose), and walk slowly from stem to stern. Like many other processes in this steady-going land, this seems painfully slow; but they keep it up with such quiet persistency, that, if you forget your boat for a little, you always find, on looking for it again, that it has gone much farther than you had expected. The movement, either by pulling or by poling, is not much slower than in France, where the boats are drawn by three or four creeping horses.

Generally, except in the innermost canals of the towns, the boats have the right of way without lowering their masts, and land-traffic must bide its time at the drawbridges (*Ophaal bruggen*) which are everywhere seen on the smaller canals. These are attached to a heavy framework, of wood or iron, above the road, which is so balanced as to be easily tilted by a single man hauling on the rope at the rear end.



A DUTCH DRAWBRIDGE.

One's first ride over the rail, from Amsterdam to Haarlem, furnishes sensations that no other country in Europe can give. The line, absolutely straight for miles, lies across a level plain. The masts and domes and steeples and gables and wind-mills of Amsterdam are falling behind us to the left; to the right, across the IJ, the low shore bristles as far as the sight can reach with wind-mills; here and there village steeples hold up their quiet points among the swinging arms; on every side, across the fields, and among the cottages and hay-ricks, sails are moving with the wind, or bare masts against it; here are crops of grain, or garden vegetables, and here stacks of peat drying for fuel; we pass farms lying much below the level of the road, and of the canals on which the boats are running; farther on, we look down into the fertile depth of the vast Haarlem Lake; we are travelling, at nearly the level of the sea,

and looking down on the houses of a teeming population, whose vast accumulated wealth would be swept from the face of the earth, were the care relaxed for a single year, which holds back the sea from its old bed in this old oozy silt of the Rhine.

After this marvellous ride of twenty minutes we roll into the station of the clean canal-washed old city of Haarlem, the beautiful old residence of the Counts of Holland. We must postpone our examination of it, for we are bound to Rotterdam and the Kermis, — we are to see the fair scene of "Faust" in real life. Excursion trains are running from all the provinces at rates within the means of the humblest class, and the Rotterdam Kermis is the sensation of the day. The broad, low fields, the superb herds, the high and busy canals, and the quaint farm-houses and towns lie all along our route, *via* Haarlem, the Hague, and Delft.

It was not yet noon when we arrived, but Rotterdam was filled with gay booths, puppet-shows, fat women, giants, and the whole range of lowly side entertainments. The streets were thronged with peasants in all manner of local costume, sailors from all quarters of the world, and low people of all sorts from far and near. Already the influence of the "sneeuwballetje" was manifest. Whatever there may ordinarily be of municipal control over the streets of Rotterdam was obviously relaxed now, and the wildest disorder prevailed. Our experiences were of questionable satisfaction; but to leave nothing undone that faithful sight-seers ought to do, we went in the afternoon to the Vauxhall, where the festivities were said to centre. We went, but we soon came, for Rotterdam beer and tobacco disputed the sway with fiery "Hollands," and the large hall was another pandemonium. Our verdict, as we took the return train, was that American ladies can gain a pleasanter impression of the Kermis in Irving Place than in its native home. We had seen a long stretch of most interesting country, but the main purpose of our trip had been signally disappointed.

An hour's sail in a little steamer took us from Amsterdam to Zaandam, on the north side of the IJ, a place of the most unmitigated Dutch character. It lies on both sides of the Zaan (which is lower than the

IJ, into which it discharges its traffic, and from each side of which extend still lower canals and ditches which discharge into it), and stretches — a single street on each side — for miles along its banks. The population amounts to nearly 12,000, but the complete little-village character of the town is never lost. Its importance is due entirely (aside from its nearness to Amsterdam) to the wind that blows over it. Towering above its little houses, and scattered over the low plain at each side, are more than four hundred wind-mills, — a forest of huge revolving crosses, grinding out the wealth that has made many of the burghers millionnaires, — and here the guide-book lore is suggestive. Each mill represents an average capital of 100,000 gulden, and wealth is estimated by mills; these form the *dot* of daughters, and the inheritance of sons. There are a hundred saw-mills and a large number of colza-oil mills, and, besides these, grain-mills, paint-mills, snuff-mills, mustard-mills, cement-mills, and flax-mills. The effect in the flat landscape of all these is inexpressibly strange. In a walk of an hour I stopped occasionally and counted never less than fifty wind-mills in sight at one time, — far and near.

The houses are almost invariably small, and generally have neat little gardens about them; some are good specimens of miniature green-painted and red-tiled luxury, and their gardens are (not always, but often) tastefully laid out, and ornamented with statuary, fine pottery, rock-work, and shrubbery. Flowers are everywhere fine and abundant, — in the gardens, and in the windows, — and the grass is well kept. At the rear there is always a neat landing-place, and pleasure-boats are numerous. The houses stand on the line of the street, and outside the windows it is usual (as all through the Netherlands) to have small mirrors set at such an angle, that one sitting inside can look up and down the street, and steal a timely glance at visitors. The windows of all the houses were tightly closed, and, although it was August, I do not remember ever seeing an open window in a private house in all Holland. On the other hand, a peculiarity that is so often mentioned is usually conspicuous only by its absence, — the closing of all front rooms, except for the Saturday cleaning. Dead-looking house-fronts are no more common than in

America or elsewhere; it is usual, everywhere, for women, whose time is chiefly passed in house-work, to leave their best rooms mainly unused; but we generally found the front windows of well-to-do people in towns and villages open, well polished, and well filled with flowers. Within, the population seems, to the casual observer, to pass most of its time in making and drinking tea. Walking, as one does, close to the windows, there is generally seen, on a spread side-table, an ornamented pail with burning peat, with a well-polished hot-water kettle over it — ready for instant use.

I walked not less than two miles up the east side of the river, crossed in one of the frequent row-boat ferries, having for fellow-passengers a woman, a dog, and an alarmed infant in a perambulator, and returned through the western half of the town. In the whole trip I saw but two horses and one donkey. The streets are all sidewalk, and as neat as possible. Locomotion is almost exclusively on foot or in boats, and all heavy carriage is by water.

The immediate neighborhood of the town is so much taken up with wind-mills and business, that my long walk failed to reach anything in the way of farming that is worthy of note, but it was rich in impressions of the most interesting novelty, — for Zaandam is more widely different from all else that we saw, even in Holland, than one would believe possible, in view of its nearness to the capital. Then, too, there is something very engaging in a town that can so serenely preserve its original character amid the whirl of nineteenth-century change, — a town where a fair cigar can be bought for a cent, and where your own women are smiled at as "queer" by one with the top-gear shown herewith. And the worst of it is that you feel queer, and begin to grow half ashamed of the different absurdity of the manner in which your companions have followed a more

HEAD-DRESS OF ZAANDAM AND KROMMENIE.

familiar custom, and to wonder how they would look — in French bonnet and pannier — standing at the door of Peter the Great's cabin in Zaandam with neck-yoke and water-pails.

A PAIL-BEARER AT THE CABIN OF PETER THE GREAT, — ZAANDAM.

As we ended our afternoon's sight-seeing, and steamed away toward the city, Zaandam soon dropped out of sight behind the high dike that protects it from the waters of the IJ, and the four hundred and odd windmills renewed their position on the tight-rope of a low line of shore, swinging their sails like balance-poles against the red evening sky.

On Sunday I went to visit a friend in Gelderland, at Roozendaal, near Arnhem. Much of the way from Amsterdam — after leaving the low country — is through an extremely barren, sandy region, purple with heather bloom as far as the eye can reach. Some of this land has been brought, by a slow process of rotation, to a tolerably productive condition, but the most of it is dismally poor. Arnhem, where we left the rail, is a very handsomely built, open town, on a high bank of the Rhine, with ample space, street parks, and fine trees. It is not unlike Leamington (England) in general aspect, but is finer. It, and the country about it, is a great resort for the burghers of Amsterdam, who "come ashore" here, so to speak, to escape the water-logged air of the hollow country, and to give their children a summer vacation on dry land. We stopped to lunch at the Club, which is a very ordinary house in the outskirts, but with a superb garden (filled with tables and chairs) overlooking many miles of the winding Rhine, with its odd-looking craft, and the fertile plain of the Betuwe

stretching its rich farms as far as the eye can reach. This is a favorite Sunday afternoon resort for the better class of the people, — pious people too.

The Château of Roozendaal — the ancient summer palace of the old Dukes of Gelderland and Egmont, who long maintained a war against Charles V. — is a well-kept country-house surrounded by a beautiful park, and a fine wooded estate, where are many avenues of enormous beeches, which it is worth the trip from Amsterdam to see.

This poor dry region has better withstood the patient attack of Dutch enterprise than has the wet country of the Netherlands, and even its wind-mills, picturesque though they are, are but small and poor after the giants of the polder-land; but even here the soil has been made to do more than would be supposed possible from the character of its native vegetation. However, it is a poor farming country at best, and must depend for its prosperity very much on its attractiveness for residence. It is especially a favorite resort for returned East India merchants, whose extravagance of expenditure, it is said, would do credit to an American watering-place. The occupied part of this region, with its superb old beeches and pleasant hills and valleys, is all the more charming from its contrast with the adjoining flat country and the polders and canals of the better known provinces of Holland.

A WIND-MILL IN THE DRY REGION.

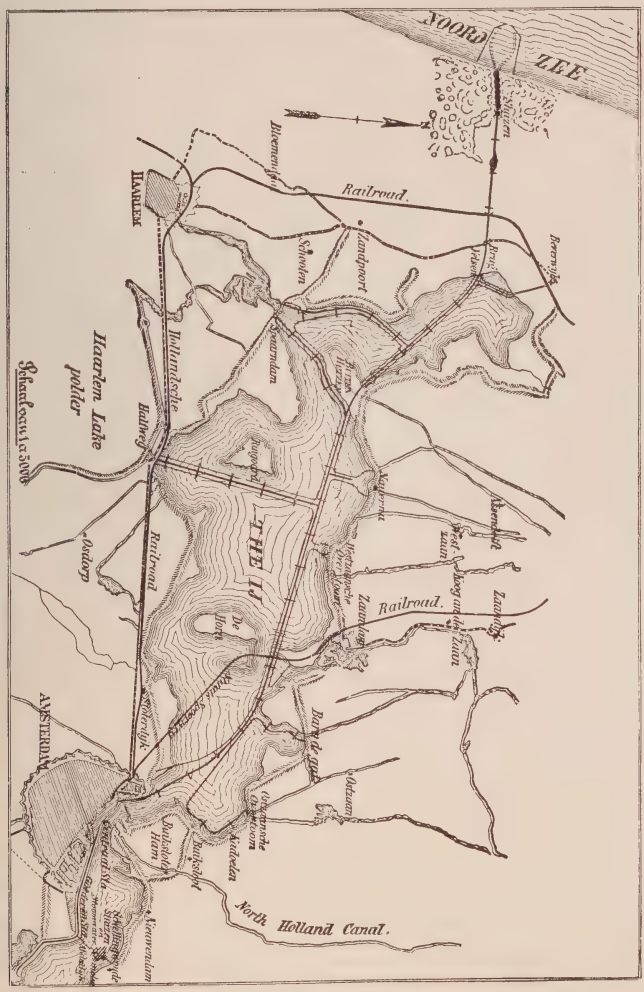
We made an agricultural trip in North Holland, which will be again referred to in the account of Dutch Farming, but some reference to which is necessary to a general understanding of the country and its peculiarities.

Immediately opposite Amsterdam, on the other side of the IJ, is the entrance to the North Holland Canal,— the Willemsluis, the largest locks in Europe. They are built on piles driven through the mud into the firm sand. The canal itself is one of the most remarkable works of this remarkable people, and is the ship channel from Amsterdam to the sea, running on one level, ten feet below the ordinary level of the sea, and much more below its highest tides, to Helder, fifty miles away on the channel between North Holland and Texel. It is more than twenty feet deep, and one hundred and twenty feet wide at the surface. "Steam on the Canals" is a long-settled problem here; the banks slope gradually, and are protected at the very edge by willow wattles. In front of these, in the water, grows a narrow belt of luxuriant rushes. As the following wave of a steamer sweeps the shore, these rushes bend before it and make a solid thatch over which the wave rolls without abrasion, and as it passes they resume their upright position ready for the next attack,— which soon comes, for the busy canal is alive with passenger boats, tugs, square-rigged vessels, canal-boats, and all manner of craft.

The treacherous sands of the Zuyder Zee made the natural approach to Amsterdam too tedious and uncertain, and this artificial passage was needed to satisfy the restless energy of the people. Now, after half a century's experience of the benefits of this canal, a larger and shorter one is being built through the IJ, and across the sand-dunes, — reaching the North Sea at a point about fifty miles south of Helder, and only about sixteen miles from the city. The line of this canal, and its branches, with its enormous dikes, is shown in the accompanying map. The fore-bay or harbor on the coast, reaching nearly a mile into the sea, its ponderous breakwaters enclosing 135 acres of water 25 feet deep at low tide, will be the most stupendous work of its kind in the world, and so much of the IJ as the canal does not occupy is to be drained for cultivation. An idea of the magnitude of this work may be formed by comparing it with the building of a ship-canal, with its surface at the level of low water from Perth Amboy to the ocean at Long Branch, building there a large harbor strong enough to withstand the storms of the Atlantic, and then draining Prince's Bay for cultivation. Except for the closing of the

east end of the bay, the undertaking would not be much greater than the changing of the IJ from its original condition to that now being effected.

The details of the construction of parts of this work indicate very



THE CANALIZATION AND DRAINAGE OF THE IJ.

fairly the spirit with which public improvements are carried on in Holland. The two jetties or breakwaters have their foundations between 25 and 30 feet below low-water mark. At the shore end they are about

three fourths of a mile apart, but their outer ends turn in so as to leave an opening of only 750 feet. The wall is carried to a height of 14 feet above low-water mark, the ordinary rise of the tide being $5\frac{1}{2}$ feet.

The jetties are built of blocks of *béton* or concrete, the main blocks measuring between 7 and 8 cubic yards (length, $12\frac{1}{4}$ feet; breadth, $4\frac{1}{4}$ feet; thickness, 4 feet). These are made in moulds, and are composed of Portland cement, sand, and gravel; they are left four months to harden before being moved. The foundation of the jetty is an artificial deposit of fragments of rock between 3 and 4 feet deep and over 200 feet wide, the thickness being sufficiently increased afterward on the outside to cover the first course of the masonry. These blocks are carried by rail to the point where they are to be used, are lowered by a steam derrick whose arm reaches 40 feet, and are placed in position by men in submarine armor.

The draught of water in the canal and in the enormous locks by which this is separated from the sea is 23 feet. The surface width in the canal proper is 200 feet, and the width of the floor or deepest part is 88 feet. The total amount of earth excavation is nearly 15,000,000 cubic yards. Over 13,000 acres of arable land will be added to the area of the kingdom, and the whole work will cost $13,000,000. It is to be completed in 1876.

Purmerend, at which we left the steamer, is an active country town (though at the same time, like all Holland towns, a seaport), is surrounded by a well-wooded walk and a canal, and has a pleasant look. It has a noted cheese and butter market, and is the market-town of the Beemster, at the edge of which it stands, and which is probably the richest polder in all the Netherlands. This polder is described in the third chapter.

After visiting some capital farms we returned to pass the night at the local inn, — where we found a good supper of eggs, cutlets, cheese, and tea fresh from a neat little kitchen all shining brass, bright tiles, and clean paint, and where we slept in tidy feather-beds, in tin bedsteads which seemed like bathing-tubs. The next day was market-day, and the

town was early filled with country people in their strange costumes, and the streets were crowded with the peculiar wagons and caleches of the region. The cheese-market was being fast filled with heaps of round Dutch cheeses, — laid up like piles of cannon-balls, — and foreign buyers were arriving. I never saw so many cheeses before in my life; some were yellow, some of a grayish color that comes with age, and many painted with various shades of red. A bright magenta was very common. The annual sales amount to about two thousand tons. In the adjoining "Boter-markt" a very active trade in butter was going on. The quality seemed but ordinary, and it was rudely put up, — evidently cheese is king here.

The cattle exposed for sale were simply magnificent, and the supply of sheep and poultry was very fine. The weekly market-day draws to the town nearly every farmer of the Beemster, the Wormer, and the Purmer, — that is, from probably the very richest dairy region in the whole world, — and they are largely accompanied by their wives and daughters dressed in all the glory of gold head-dresses and lace caps, and with the odd hats of their localities. The most curious dresses that we saw here were those of some women from Marken. The people were cheery and hearty, attentive to their business without excitement, but far from being stolid in their looks, or sluggish in their movements. Indeed, a similar congregation of American farmers would not appear very different, except in their dress and surroundings, — and in the lack of that indescribable *aplomb* that comes of the possession of wealth; for these men, who make cannon-ball cheeses at the bottoms of the old lakes of North Holland, are of more than comfortable substance, and the two ends of the year always meet with a liberal lap.

From Purmerend we took our first long drive, — two hours and a half to Alkmaar. We had an old-fashioned, high, four-wheeled barouche, drawn by a single horse. Not knowing the roads over which we were to roll as over a floor, could I have spoken Dutch I should have protested, in the interest of the humane treatment of animals, for we were five persons including the driver, and the distance was long. At the edge of the town we crossed a drawbridge, and the road pitched down to

the floor of the old Beemster lake, where formerly crabs and lobsters and eels had their foraging-ground; — we were travelling in the old home of the fishes, and far above our heads lay the imaginary track of keels bearing the fierce corsairs of the days of the Spanish wars, — we were at the bed of a surging inland sea, large enough for a naval battle, and deep enough for the largest tonnage. Yonder, high above us, the sails of vessels are skirting the ancient domain of their tribe, as though longing for one more free scud across its waves. Below us, the little cross canals nurse all that is left of marine life, and bear the little boats that alone remain of the fleet of former days.

The waters have been rolled back, and we crossed upon dry land, — upon the dry bricks with which the long straight roads are paved. Long, and straight, and flat, they run on interminably, between sheltering ranks of fine trees; between canals, where swans are sailing and boats are moored at little painted front-yard landings; between handsome old family mansions set about with ancient trees and parterres of gay flowers; between red farm-houses, with their huge backing of red-tiled barn-roof, and with their straight rows of blue-washed tree-trunks; between fields of waving grain; between pastures where, as the Hollanders say, "you can see the gold lying on the ground," and where dense herds of superb black and white cows lie lazily mourning their incapacity to eat forever. The very air is heavy with the sense of wealth, and one grows envious of the sea, that it should still cover other fields of such boundless fertility.

When we reached the neat little, odd-looking village of Beemster, in the middle of the polder, the rim-dike (with fifty great wind-mills standing sentry upon it) was such a distant horizon that we did not realize its height, and seemed to be standing at the ordinary level of the land, not far below the level of the sea. Indeed, this feeling is usual throughout Holland. We take our standard from our immediate surroundings. One cannot carry "the level of the sea" always in one's mind, and the general impression of the country is that it is *flat*, rather than that it is *hollow*. The waves are beating against the dikes, it is true, and were these to give way we should be overwhelmed with conviction as to the

true datum line, — but while they hold the waters back, it is only near the points where the levels change that one has any real sense of the situation. From the railroads one looks down upon canals, which, in their turn, look down upon the land, and this again down on lower canals, but there is generally no such startling contrast as the eloquence of the guide-books implies. The keels of ships hardly float above the chimneys of the houses, nor does the storied frog, croaking among the bulrushes, gaze down upon the swallows on the house-tops.

Midway of our route we climbed up the steep dike, crossed the encircling canal, and rolled on toward Alkmaar, over the smooth klincker road. Klinckers are "stones rejected of the builder," — bricks burned too hard, and often too much warped for use in houses. They are set on edge and firmly imbedded in sand, and make a capital roadway for the light traffic which alone goes over them. The road-bed is always thoroughly drained by the side canals, and grass usually fills the interstices of the pavement with its roots. Capital as these klincker roads are for Holland, they are practicable only because all heavy traffic is by water-carriage. Alkmaar we found not sufficiently different from Leeuwarden to need particular description, nor will space admit of further details of town life, — interesting though all Dutch towns are.

We paid due attention to the very general cultivation of flowers, and found it worthy of all encomium, — especially the superb mosaic planting at the Zoölogical Gardens at Amsterdam, which far exceeded in the tasteful massing and contrast of colors, and in the scale on which it is carried out, all that we saw in London and Paris, and all our previous conceptions of the possibilities of flower gardening.

From that most charming of modern towns, S'Gravenhage (The Hague), we went by trekschuit, or passenger boat, along the canal to Scheveningen, drawn by one horse, moving at a slow trot; the distance is about two miles, and the canal lies mainly through a fine primeval wood. Scheveningen is a very primitive fishing village, behind the dunes of the North Sea coast, and across these is the splendid bathing beach, which

makes it an attractive resort for the fashion of a large part of Germany, and for summer travellers from all the world. At the top of the sand-banks is a long row of hotels and restaurants. Passing these, we come at once upon the most modern of scenes, — modern, yet of its own sort. Along the edge of the beach were "bathing-machines" by the dozen; a little farther back were ranks of covered chairs, made of basket-work, each with a footstool. These are engaged by parties of friends, who gather them into groups, — and there they sit, shaded from the sun and sheltered from the wind, and knit and sew and chat by the hour. Children are digging in the sand; beaux are plying their arts of fascination under the cover of chair-hoods; bath-women are standing expectant beside their baskets of bathing-dresses, leaning on sign-boards

A DUTCH BATHING-MACHINE.

THE BEACH AT SCHEVENINGEN.

bearing their names, as "Antje" or "Marie"; sight-seers are staring; booth-men are calling for custom; and the whole scene is gay and cheerful and summery. Red-sailed fishing-boats are moving about near the shore, and (as we saw it) the sea is blue and still against the deep blue sky.

We returned by the horse railway that leads through one of the side allées of the beautiful Scheveningen road, past a continuous succession of attractive country-houses, and close to the klincker road, on which equipages fit for Hyde Park dispute the way with fishermen's carts drawn by dogs, and with basket-laden men and women carrying their shining harvest to the market in town.

FROM SCHEVENINGEN TO THE HAGUE.

The trekschuit is an institution peculiar to Holland, and the tourist should not fail of its novel experiences. It is a low, narrow canal-boat (such as is shown near the Leeuwarden Boter-Markt) plying for passenger traffic, drawn by a horse whose rider is expert at his work. The tow-line is very long, made of the best hemp, and not larger than an ordinary clothes-line. As the horse trots it vibrates in long waves, and is never drawn taut enough to be strained. The skill with which this line is managed in shooting bridges and in passing other boats is interesting to watch.

Just before sunset we took the trekschuit at The Hague, bound for Delft, — an hour's ride. The air was perfectly still, and the water like glass. The leaves glowing in the sunset light, and the rosy evening sky, were reflected in the quiet canal. The long twilight lasted throughout the journey, and made it forever memorable. We passed small villages, little beer-gardens, and many country places of some pretension, where families were drinking tea in the hooded summer-houses, which are seen

in all Dutch gardens. A more peaceful, restful, summer-evening scene it would be impossible to conceive, — nor one more entirely unlike all other experiences of European travel.

The trip to Delft was, of course, a pilgrimage to the staircase where the Prince of Orange was assassinated. We had fallen on the end of a Kermis, with which the town was still reeking, and at the little café in the arbor of which we took our tea we had for neighbors an elderly and skinny house-servant, who was having the last of her young hired lover, — this industry of attending, for a consideration, a damsel whose natural attractions have waned being still profitable to seedy youth at Kermis-time. With dexterous slyness she passed him a gulden, with which to order the next relay of Hollands, and after Jan had served them and taken out the amount due, she exacted the furtive return of the change, — repeating this fiction with each frequent new supply. Her gold head-dress and her brazen face seemed a heavy charge to the poor stripling, who had evidently been on duty from early morning, and we longed to see him paid off and released; but evidently the "ten-hour system" had no regard from his ill-favored mistress, and he was still smirking and counting back her stuyvers after each payment, when we left for the late train to The Hague.

SCHEVENINGEN FISH-WIFE.

This fragmentary and ill-connected sketch is not presented as a satisfactory account of what is to be seen in Holland, — only as a framework in which to set the chapters that are to follow, — on the Drainage and Agriculture that I had come to see. The character and customs of

a people throw much light on the character of their industries, and are inevitably considered in connection with them. It has been thought proper, therefore, to give some of the impressions which were gathered while these were being more especially studied, and which formed a running accompaniment to their more serious strains.

ON THE CANAL FROM THE HAGUE TO DELFT.

CHAPTER II.

DROOGMAKERIJ.

WE spell it differently here, but the art of drainage is itself so much more an art in Holland, that one is tempted to dignify and distinguish it by its more ponderous Dutch synonyme.

How the silt of the Rhine, and the blending of its currents with the tides of the North Sea formed the sand-bar that stretched with occasional interruptions along the front of its wide-mouthed bay; how the waves and the winds raised this sand-bar above the level of the sea and tossed it into high dunes; how the slimy deposits of the river settled in the stilled waters behind, and by slow accretions rose to the reach of the sun's warmth; how the reeds and lily-pads and bulrushes then covered the face of the flood with the promise of a fertile land that was to grow from their gradual accumulation and from the ever-coming wash of the Rhineland and the higher Alps, — all this is clouded in the gloom of prehistoric speculation.

When Cæsar came to Batavia vast forests grew at the level of the water, quaking morasses lay on every side, and the oozy soil was only here and there thrown high enough to give a foothold to the scant and hardy population. Travellers of that time relate that the whole land could be traversed on fallen timber without touching the ground, and rivers were blocked with rafts of uprooted oaks. The climate had an almost Norwegian fierceness. Even four centuries later the country was described as an "endless and pitiless forest."

Out of this waste of water and almost floating soil — driven now here and now there by the unbridled floods of the Rhine, or melted into silt again and swept away by fierce inroads of the sea — a noble people has created the fertile and productive home of a compact and most pros-

perous commonwealth; has defended it in long and ferocious contest with the mightiest power of Europe, and stands to-day the proudest example that our race has to show of conquest by patient and unflinching toil and devotion, over the combined opposition of nature and of man.

The changes made by inundations have been almost incredibly great. Fig. 1 shows the northwestern portion of the Netherlands before the

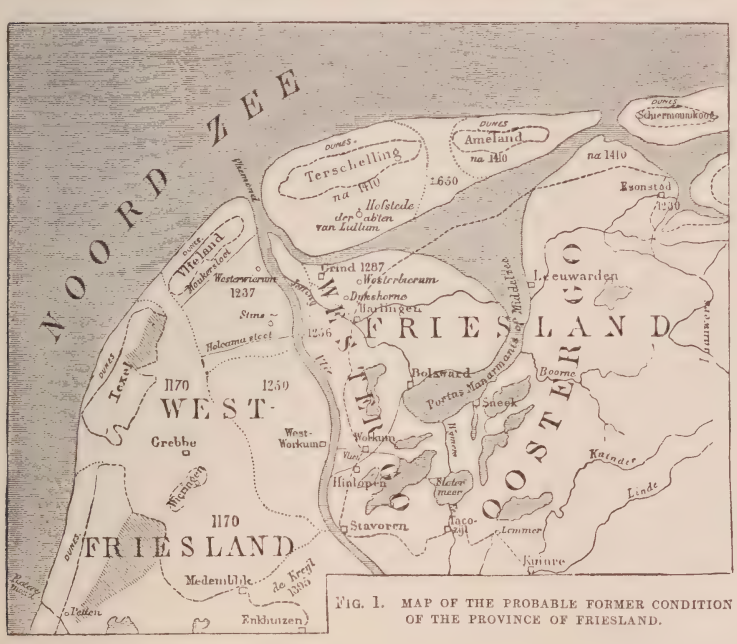


FIG. 1. MAP OF THE PROBABLE FORMER CONDITION OF THE PROVINCE OF FRIESLAND.

floods of the twelfth century, as contrasted with their present condition. A large part of that arm of the German Ocean which forms what is called the Zuyder Zee was formerly inhabited and cultivated land. Successive irruptions of the sea have melted away this vast tract, until from Harlingen to Texel all is now navigable water. In the final inundation which effected this opening 80,000 lives were lost.

In 1277 an irruption of the sea, sweeping 44 villages from the face of the earth, carried the borders of the Dollart beyond Winschoten. Gradual reclamations have reduced it to its present size.

Frequent inundations are recorded from the earliest history of the

Netherlands. In 1570, 100,000 lives were lost, 30,000 of them in Friesland alone, this province and Groningen having always been the greatest sufferers. Since then the inundations here have been less frequent and somewhat less disastrous, Señor Robles de Billy, the Spanish commander in Friesland, having inaugurated a new and more suitable system of diking, and thus rendered such service that his deeds have been commemorated by a statue, — the "Steenen Man" (the stone man), which stands on the immense dike at Harlingen.

Internal inundations, arising from the action of storms on the inland lakes, and still more from the floods of the Rhine, have been only less disastrous than the breaking in of the sea itself. The Rhine, bringing vast deposits of soil in its flood, is always lifting its bed, and constant additions to its dikes are thus made necessary. Then, too, while its northern waters are frozen, the more southern sources of its current are already unlocked, sending down freshets, which are dammed back by the ice and even thrown out of the banks, flowing over fertile farms, and constituting a never-ending source of danger.

FIG. 2. MAP OF NORTH HOLLAND IN 1575.

The condition of the best part of North Holland in 1575 is shown in the accompanying map (Fig. 2). Leaving out the barren sand-dunes along the coast, there was less land than water; and such land as there was had to be defended by constant care, not only against the incursions

of the higher-lying sea, but equally against the waters of the interior lakes, which often stormed the protecting banks of the reclaimed country with such force as to break through and do vast harm. The land was divided into polders, which were kept dry by pumping. There was little soil so high that artificial drainage was not necessary, and the whole territory was saved from being overwhelmed by the sea only by the dunes and by artificial embankments.

On this insecure soil the Dutch made their successful stand against the Spaniards, often cutting the dikes and flooding miles of fertile country as the only available defence of their liberties and their lives. From the rich ports, scattered over the interrupted land, they controlled the commerce of the world. Education was universal, as it was nowhere else in Europe; nearly the whole population could read and write. Flanders and Italy were the richest and the most industrious and flourishing of the Western nations.

To what extent the character of the people, and the condition of the land in which they have lived, have reacted upon each other, it would be curious to examine. Certainly the success of such enormous undertakings bears evidence of great strength of character, natural or developed. Taine describes the Dutch as a people who can sit for hours *en tête-à-tête* with their thoughts and their pipes; a people who feel a sufficient stimulus in successes to be reached only years hereafter. Their life has always been practical, earnest, and driven by the hard necessities of their anomalous position. Of them it might have been said from the first: "Obstacles change themselves into auxiliaries."

There is no field of human enterprise in which their success has not been at one time or another notable. At the bottom of it all, apparently at the bottom of the character on which their success has been founded, we find their traditional jealousy of every acre of water which covers good land. Neglecting the poorer lands, they have dived into the fertile deposits lying under water and peat, and sought there a wealth that no other soil can equal. Seeking this, as it alone could be sought, by hard, slow, and costly work, they have become patient, long-enduring, sturdy, hardy, and resolute. If a lake is to be drained they sit quietly

down and count the cost, the time, and the interest that time will add to the cost, and then devise the means for the most effectual accomplishment of their aim; this done, the undertaking proceeds with the regularity and the persistence of the work of ants. If obstacles cannot be made auxiliaries they are overcome. The clamors of dissatisfied people are idle, — not as the wind, for the wind is not idle in Holland, — but they pass unheeded, and steadily, day by day, the toiling goes on until the end is gained, and a new territory has been added to the earth's domain.

In the pursuit of their aims it would almost seem that no cost is too great. The whole country bristles with the evidences of the most gigantic expenditure. The coast of Friesland is held against the attacks of the sea by works which include sixty miles of piles three rows deep. Near Haarlem a dike of Norwegian granite, forty feet high, and stretching two hundred feet into the water, continues for a length of five miles.

Since 1575, three hundred years have passed, and now nearly all the vast wastes of water among which the films of land formerly threaded have been pumped off from the face of the earth. The map of the North Holland of to-day is shown in Fig. 3. After the IJ has been canalized and its broad area laid dry, there will remain in all the province only the water needed for navigation.

FIG. 3. PRESENT MAP OF NORTH HOLLAND.

In a certain sense the whole world knows about the draining of the Netherlands, but their knowledge is of that sort which gives an impression rather fanciful than real. Holland is a broad land rather than a deep

one, and while the traveller is often below the level of the sea he does not often realize the position from any obvious contrast. The sea is out of sight, and the canals are themselves below its level often by several locks, so that in its general aspects the country as seen from the railway seems only a wide plain, with its canals raised on low embankments and its house-tops hidden more than such embankments should hide them. We see the polders mainly from the outside, and so fail of getting a due impression of their depth.

The marvel that we expect to realize is the freeing of all this low-lying land from its old-time floods, — but the water is gone and we need to be told that these fertile farms and blooming flower-beds were once at the bottom of deep lakes. Those who have taken their information from popular descriptions are quite sure to have wrong ideas, and I confess that my own first view of the flat country of Holland was a disappointment.

Away from the canal-netted towns there was much less of the amphibious element than had been anticipated. With one who makes only a rapid run through the country by rail this feeling of disappointment will be likely to remain; but he who gives more attention to the special problems of Dutch drainage must soon find himself astonished that so much could have been done by so small a people, and that the reality should be so much more interesting than the suggested fancy.

Nearly the whole of North and South Holland is a level plain, stretching from Helder to Zeeland, and lying behind dunes or sand-hills on the sea-coast. It is a level plain in the sense of having no elevations, but it is full of depressions, where the surging of the old-time waters washed away the half-soluble soil and floated it out to sea. Much of the land remaining is of a sort that may be in like manner easily destroyed. This plain formerly stretched away to the eastward and northeastward, through Friesland and Groningen, but the formation of the Zuyder Zee has made a wide separation between the two districts.

The unit of all Dutch drainage is what is called the "polder," a term which applies to any single area enclosed in its own dike and drained

by the same pumps. Some of these are but slightly below the level of the surrounding country, and need but a slight embankment; such are often of tolerably firm soil, and require only the removal of the water to make them fertile. Others were originally ponds or lakes, or deposits of wet muck, which have been enclosed by more substantial embankments, and from which the removal of the water was, and continues to be, a more serious operation. Polders are frequently formed after the removal of the peat and its sale for fuel. Its place is occupied with water, and then begins the fresh operation of improving the embankment, removing the water, and often even adding a large quantity of foreign matter to make fertile soil. Sometimes the peat is found under a stratum of arable soil several feet thick. This is carefully laid aside to form the basis of cultivation after the peat is removed and the drainage completed. The boats which take turf to the cities bring back street sweepings, builders' rubbish, and waste of all kinds, which in all towns in Holland, large and small, are said to be carefully collected and sold for filling depressions from which turf has been raised.

The polders vary in size from two or three acres to over forty thousand acres. They are sometimes only a few inches below the established level of the outlying water, sometimes seventeen or eighteen feet below this. Those first drained were shallow marshes, which could be secured by slight dikes and drained by a single small mill. Later, when the country had made more progress, the system was applied to deep marshes and lakes, requiring large and strong dikes, and a number of large mills for their pumping. The interior of each polder is cut with canals and ditches, which serve to lead the water toward the mills, and in summer for the distribution of the water admitted from without. In the district of the "Rijnland" there are nearly ninety thousand acres of land, which, but for the combined skill and perseverance and capital of the people, would be buried, much of it under seventeen feet of water. The polder drainage alone, aside from the Haarlem Lake, employed two hundred and sixty wind-mills.

The next step in the organization is what is called the Hydraulic

Administration. This is a body of skilled men, some of them engineers, who have charge of the hydraulic interests of certain districts. The Administration of the Rhineland, for instance, has complete jurisdiction in all matters concerning the dikes and drains of that part of North Holland lying between Amsterdam and the sea on the east and west, and between the IJ and the environs of the Hague and Gouda on the north and south. Their territory includes Leyden and Haarlem and the great Haarlem Lake. These administrations have entire control of the means of outlet for the drainage waters, and of the mechanical appliances by which their removal is facilitated. They have also a supervisory control over the drainage government of the different polders in their districts. The district is divided into two classes of territory, the Polders and the Basin. The polders are governed by officers appointed by local proprietors; the basin, entirely by the Administration. The latter consists of all canals of communication and other channels for the removal of the water pumped from the polders, and also of any undrained bodies of water that may exist in the district. One of the most important duties of the Hydraulic Administration is to establish the maximum level of the water in the basin, and when from any cause the water has reached this level, to see that no more water is pumped from the polders until it shall have subsided below it. Control is also taken by this body, of all questions arising between different polders as to the injurious effect of the pumping of one upon the interests of the other. The care of the exterior defences — defences against the influx of water from the sea or from interior sources — forms an important part of their office, and, indeed, the safety of the country depends, more than on anything else, on the vigilance with which in time of danger the detailed dike-guards are made to attend to their duty.

When southwest gales have long prevailed, forcing the waters of the Atlantic around the North of Scotland, and are then succeeded by northwest gales which blow these waters into the German Ocean beyond the capacity of the English Channel to pass them, they are piled against the coast of Holland with terrific force; the high tide is prevented from receding, and the next tide, and sometimes even the next, is piled upon

it by the winds until only the utmost exertion suffices to prevent its surmounting the dikes. In such times, an army of men hastily build a new dike on the top of the old one, contending with the waters inch by inch, and so preventing that first damaging flow which is like "the beginning of strife."

The hydraulic administrations are of such universally recognized importance that they have always been respected during political troubles and revolutions, and in spite of the administrative or judiciary subdivisions of the country.

The polder-masters, or the local authorities for the regulation of the drainage of the individual polders, have charge of the maintenance of the dikes and mills, and of the opportune removal of the waters. The Hydraulic Administration is charged with the maintenance of a just equilibrium between the interests of the polders and those of their own works of drainage, and with the control of intercommunication, etc. The point at which the level of water in the basin shall be fixed, and the strictness with which it is maintained, are the cause of frequent difficulty between the two organizations. The authorities of the polders are naturally anxious to make their draining as rapid as possible, and frequently continue the working of the mills after the fixed level of the waters without has been reached, hoping to escape detection, or risking the penalty that may result, — anything rather than that their own polders shall remain submerged. The owners of polders with strong and high dikes often care little that, in draining them, they injure neighboring polders with smaller or feebler dikes, and it requires the strong authority of the Administration to which they belong to prevent serious injury from this source.

No view of Dutch drainage would be complete which did not take into consideration the vast production of peat for fuel. In spite of the fact that Newcastle coal can frequently be delivered at Amsterdam or Rotterdam for less than its price in Dublin, and that German coal can also be had at very low cost, yet by far the largest part of the fuel used in the Netherlands, not only for domestic purposes, but for steaming, brick-burning, and all manner of manufactures, is the peat taken from

their own bogs. The annual consumption amounts to millions of tons, and is constantly increasing. So strong is the influence of the profits of the peat-trade, that even in this country, where land is so high in agricultural value, and where so much of the energy of the people is devoted to the reclamation of submerged lands, there is a constant destruction of fertile fields in the interest of those who seek the fuel lying beneath the soil. This latter is rapidly removed, strip by strip, and then, the substratum of rich peat being taken out, the trench from which it came is allowed to fill with water, — thus to remain until the new draining at the lower level shall have restored it to cultivation. Some of these turf-lakes have attained great size; the polder called Zuidplas, near Rotterdam, about 14,000 acres in extent, was an artificially formed turf-lake. The turf-lakes lying east of Haarlem Lake, and parts of which have long been drained, were of even greater extent. Now, no such removal of turf is permitted until provision has been made for payment into the public treasury of enough to cover the taxes due from the land while it shall remain covered with water, and the cost of the final drainage.

Each polder is supplied with a gate for the admission of the exterior water. These lands, although so low, and though created by artificial drainage, suffer quickly from drought, owing to the lightness of their soil, and it is important to their fertility that the water in the interior ditches and canals be not, in dry weather, reduced below a certain level; fortunately the means are always at hand for the needed supply.

Wind-mills have been used in Holland for the drainage of land from immemorial time. The little mill, with a vane or tail to turn it toward the wind, which is much used in Friesland, costs about 300 gulden. The large mills used in deep draining cost even a hundred times this sum. These are, indeed, large, and a row of them at the side of a canal is really imposing.

Fig. 4 shows a row of such giants near Rotterdam. The foundation, to the height of the doors, is of stone or brick; on this rests the superstructure, which, including the revolving hood, is beautifully thatched with straw. The turning of the sails toward the wind was described in

the preceding chapter. The interior mechanism is shown in Fig. 5, which is a section of a smaller mill. The paddle-wheel is actuated by a simple

FIG. 4. A ROW OF GIANTS.

communication with the wind-wheel; it drives the water up an incline to a higher level.

With no important modifications, this is the type of all draining-mills, except a comparatively small number, where the Archimedean screw is used. Each mill of the larger size is capable of raising water to a height of about four feet. With a fair wind, it will lift to this height from 5,000 to 10,000 gallons per minute. Each wind-mill is under the charge of a man whose family makes its home within it. The most quaint and charming room into which I went in Holland was the principal room in the foundation story of the first wind-mill shown in Fig. 4. The arrangement of this story is shown in Fig. 6; the ceiling, supported by heavy oak timbers, was darkly oiled; the floor was covered with smooth red tiles. Between the windows was a hearth of blue-and-white Dutch tiles, these also covering the back of the fireplace for the full width of the hearth, up beyond a point where it was screened by the curtain hanging about the front of the chimney-throat. Against this bright back

hung a polished steel chain and hooks, from one of which was suspended a polished brass kettle over the little fire of smouldering turf. At one side stood a tall, carved clock. Opposite the fireplace was a well-arranged and very old dresser, well furnished with Delft ware and other quaint pottery. The other furniture of the room was of old style, quaintly carved, and mounted with brightly polished brass ornaments. The windows were low, broad, white-curtained, and bright, and the whole air of the place was unique and entirely in keeping with its simple use and the leisurely life of the mill-tender's family. The people were polite and friendly, and they willingly allowed me to inspect the general construction of the mill.

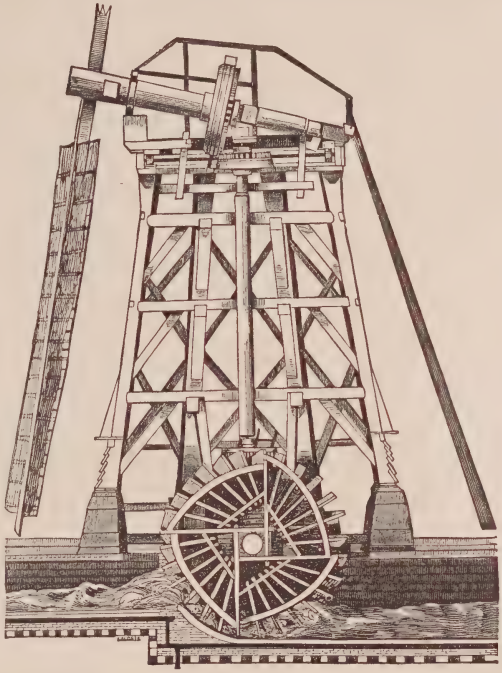


FIG. 5. CONSTRUCTION OF PUMPING WIND-MILL.

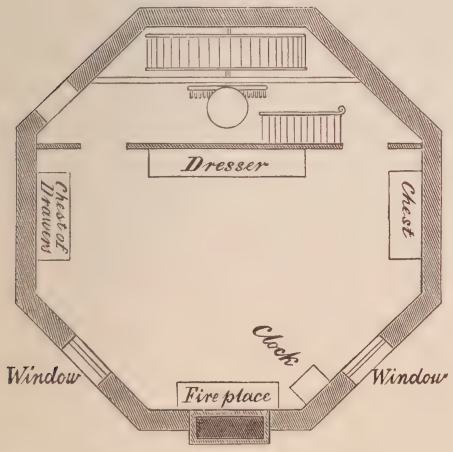


FIG. 6. GROUND-FLOOR OF WIND-MILL.

The influence of the wind on the level of interior waters is important to be considered, as affecting the level at which the pumping of the polders is to be stopped, the rapidity with which water is discharged at the outlet sluices, and the danger with which the containing banks are menaced. In a large basin like that

of the Rhineland before the draining of Haarlem Lake, when a strong south wind blows, the water is raised in the northern part to such a height that the northern polders sometimes cannot be pumped, however great their need of it, while those at the south have ample margin. The force of the wind made sometimes a difference of over three feet between the levels at the opposite ends of the Rhineland basin.

In Dutch drainage-work the dike is a very important element. These vary, of course, according to the circumstances under which they are required. On the North Sea coast, where they are built to withstand tides rising ten feet beyond their average, and lashed by storms, they constitute a work of stupendous magnitude and cost. In the case of a polder of a few acres they may be the work of a single man. Occasionally in their construction serious engineering difficulties are presented; especially is this the case where the dike is to be built in the water. Here the two sides of the foundation, which must reach from the solid earth to the surface of the water, are made by sinking great rafts of fascines made of willow osiers, often from 100 to 150 yards square, strongly secured together, and making a compact mass. These are floated over the place they are intended to occupy. Here they are guided by poles sunk in the bottom, and are loaded with stones or with earth until they sink. Upon this first, a second and smaller one, and often a third, and even a fourth, always decreasing in size, are placed in turn. The space between the two walls is filled with solid earth, and on the top of this secure foundation the dike is built. If the dike is to remain exposed to moving water, it must be further protected by jetties or by mason-work, or by wattles placed upon its slope, or by rows of piles, basket-work of straw or rushes, or sometimes by brick walls.

The security that all this enormous work affords is maintained only by eternal vigilance. Even a mole-track may be the beginning of an inundation that will soon destroy the whole. As a consequence, the engineering supervision and control of all public hydraulic works assumes an importance in the Netherlands nowhere else known.

The standard of all water measurement in Holland is a bench-mark at Amsterdam, showing the ordinary level of water at that point. It is indicated by the letters A P (Amsterdamsche Peil), and is the zero point to which all hydraulic descriptions of Holland refer. It will be used in this paper. It is 2 feet 4 inches above ordinary low water, and about 2 feet 7 inches below ordinary high water. Levels above this bench-mark are indicated by + A P, those below by — A P.

The Rijnland is protected against the North Sea by high sand-dunes along the coast, and against the IJ by a vast dike stretching along its southern shore from the dunes to Amsterdam, its crest being nearly ten feet + A P. Before the drainage of Haarlem Lake this administration covered over 300,000 acres, 75,000 (including the dunes) being naturally above the water level, and 175,000 polders or drained lakes; the remainder, constituting what is called the Basin, covered the undrained lakes, canals, and water-courses, constituting an area of about 55,000 acres.

The accompanying map (Fig. 7) shows that portion of the Rijnland about Haarlem Lake, — a body of water which attained the proportion here shown only by slow extension, as the soft soil has been washed away and removed by the drifting waters. The dotted line shows the contour of the water in 1531. Successive removals since then, up to 1740, brought the lake to the form given. The double-dotted surrounding line shows the position finally adopted for the dike.

The Administration of the Rijnland dates back beyond the earliest history. It was recognized by the king in 1253. It is directed by a college of seven members, nominated when vacancies occur by the remaining members and confirmed by the king. They revise the annual accounts of the polders, decide disputes concerning questions of drainage, establish and maintain all hydraulic works of general utility, and divide their charges pro rata among the polders benefited. In financial matters it is subject to the decision of a board composed of some of the principal landed proprietors chosen by the land-owners at large. While it is in theory subject to the inspection of the government, it is practically uncontrolled in its very excellent management of the affairs intrusted to it.

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Serious ground for apprehension existed in the great restriction of the basin of the Rijnland by separating the lake from it, reducing it to

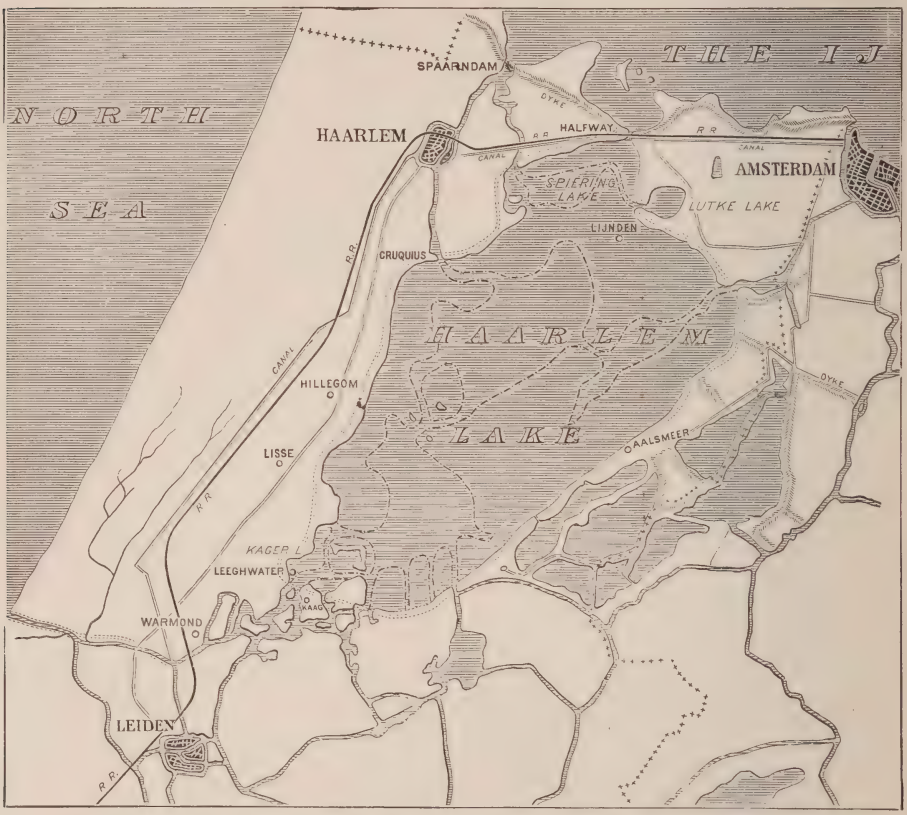

FIG. 7. MAP OF THE RIJNLAND BEFORE THE DRAINING OF THE HAARLEM LAKE.

about one fifth its former size; not only from the danger that it might be overflowed during the pumping out of the lake, but that after the polder was subjected to cultivation there would be, during summer droughts, too little water available for the necessary supply of its canals and ditches. This apprehension could be met only by theory, and the Administration of the Rijnland, naturally jealous of its rights and impressed with its duties to its constituents, was slow to concede its permission for the execution of the plan.

A long discussion resulted in a contract between them and the Com-

mission, which acted on behalf of the government. This contract was exceedingly strenuous in its restrictions, and illustrates the degree to which the government defers to the Hydraulic Administrations, on which so much of the safety of the country depends. It is difficult for those not familiar with the drainage of Holland to understand how the question of a half-inch more or less in the elevation of the water should become a question of state, yet this character was assumed by one of the disputes that arose during the work, when it was asserted that the pumping had been continued until the water had risen half an inch above the established mark.

This contract held the Commission to the strictest responsibility, and required them to stop the action of their pumps whenever the basin should rise higher than a point 5.4 inches in winter or 11.2 inches in summer — A P. They were required to establish such works as might be necessary to supply fresh water from without whenever in dry weather the basin should descend lower than seventeen inches — A P. As fast as the drained lands were put in cultivation they were to pay to the Administration their proportional taxes. The drainage being completed, the polder was to form a part of the territory of the Administration, this body having also the same control of the navigation of the encircling canal that it had of other waters within its district.

The drainage of all the large polders of Holland is an interesting subject of study, but all the others sink into relative insignificance when compared with Haarlem Lake, which, being the latest and the largest work of its kind in the world, is selected for the illustration of the system followed.

This lake had always been a source of great danger to the cities of Amsterdam, Haarlem, and Leyden, and the known fertility of the soil at its bottom was always a strong temptation to enterprising improvers. Schemes for its drainage date back for more than two centuries and a half. As long ago as 1643 a mill-builder, named Jan Adriansz (surnamed Leeghwater), published a detailed plan for the drainage of the lake, which passed through thirteen editions (the latest in 1838).

Leeghwater proposed an enclosing dike with a canal outside of it, but he omitted a portion of the southern end (the Kager meer). He proposed to use 160 wind-mills, 40 upon each of four different elevations, raising the water from one to the other. The outlet of the basin of the Rijnland at Katwijk did not then exist, the Rhine having been closed with silt and drift. Another similar plan appeared about the same time, and then the question rested for a century. In 1742 the engineers of the Rijnland prepared a new plan, leaving out not only the Kager meer, but also the Spiering meer at the north. They proposed the use of 112 wind-mills. After this time the subject was frequently discussed. It had much attention from the government, and many modifications of the plan were proposed, some greatly extending the boundaries of the land to be drained.

The first proposal to make use of steam as a motive-power was made by Baron Lijnden, who recommended eighteen steam-engines to drive rotating paddle-wheels, similar to those used with wind-mills. As time passed on, plans and descriptions multiplied, and the use of steam alone, or as an accessory to wind-power, was more and more considered. During the whole two centuries there were fifteen well-studied plans submitted to the public or to the government.

Final action was stimulated by the repeated hurricanes of the autumn of 1836. On the 9th of November the fierce west wind drove the waters of the lake violently upon Amsterdam. They swept across the intervening polders, and above the roads and dikes, to the very walls of the capital. On Christmas-day another storm blowing from the east carried the waters of the lake toward Leyden, submerging a part of the city. The waves broke the dikes, or poured in cascades into the deep polders. In November, near Amsterdam, the water rose nearly three feet + A P, and flooded nearly 100,000 acres of polders. In December an equal height was attained, over 18,000 acres of polders being inundated. With extraordinary cost and energy, it was still more than a year before the submerged lands were made dry again. This was the deciding circumstance which resulted in the formation of the commission for the drainage of Haarlem Lake.

The chief area of the modern Haarlem Lake was formerly an inhabited country. According to an old map of 1531 (as indicated by the dotted lines in Fig. 7), there were at that time only four small lakes. Two roads crossed the whole extent, and there were three flourishing villages. These lakes occupied together less than one third of the modern area. In 1591 one of these villages had already disappeared, and in 1647 the others had gone, and the four lakes had run into one. The cause of this continual loss of land, as has already been explained, is to be sought in the exceedingly fine and siltable condition of the soil, which is readily moved by moving water, and yields rapidly to the force of strong waves.

The soft bed of the lake is tolerably uniform, and was covered with rather more than thirteen feet of water. The firm soil lay more than sixteen feet — A. P.

The plans which were finally adopted for the drainage involved: —

1. The building of a huge dike entirely around the lake for a distance of about thirty-seven miles, and outside of this a canal, 131 feet wide, serving the double purpose of affording a channel for the active navigation, now to be excluded from the lake itself, and for the escape of the water of drainage during and after the formation of the polder.

2. The enlargement of the canal and lock at Katwijk, to secure the more rapid escape of the waters delivered at that point.

3. The erection of steam-works at Spaarndam and Halfway to secure the more rapid discharge of these outlets into the IJ, and to prevent the interruption of the flow on the occasion of unusual rises of the water in that arm of the sea.

4. Another of like character at the southern border of the territory of the Rijnland (at Gouda) to improve the drainage of the polders of this region, — this not necessarily as an aid to the drainage of the lake itself, but as an inducement for concessions on the part of the Administration of the Rijnland, to whom such works would be of great advantage.

5. The establishment of three pumping-stations at the borders of the lake, each supplied with lifting-pumps worked by enormous steam-engines specially invented and constructed for the work. One of these pumping-

stations, "The Cruquius," was fixed at the junction of the Spaarne with the encircling canal, and the other two at the ends of the longitudinal axis of the lake ("The Lijnden" opposite the Lutke meer, and "The Leeghwater" at Kaag).

The estimated cost of the enterprise was 8,355,000 gulden ($3,342,000 gold, or about $75 per acre for the land to be reclaimed).

The scheme was finally adopted by the States-General by an immense majority in 1839. The commission charged with the work comprised thirteen distinguished engineers, landed proprietors, and state counsellors, under the presidency of Gevers d'Endegeest, to whose elaborate monograph I am indebted for many of the statistics given in this chapter.

The dike was entirely to isolate the lake, without locks for the admission of boats to the canals of the future polder. It was to be, on the firmer ground bordering the lake, a simple embankment of earth; where it crossed creeks and canals it must be protected by loaded caissons sunk in the water. These works under water covered a length of nearly two miles, and presented in many cases serious engineering difficulties.

The general character of the dike and canal will be understood from the accompanying profile, Fig. 8. For a width of 95 feet the canal has a depth of over 10 feet. The dike rises to a height of $7\frac{1}{2}$ feet + A P. The banks of the canal have a slope of 2 to 1, and are bordered by a level strip about 6 feet wide, which is slightly covered by water. Between the canal and the dike of the lake on one side, and the dikes of the adjoining polders on the other, there is a level roadway.

The body of the dike is generally composed of the peaty earth thrown up in the excavation of the canal. It is cov-

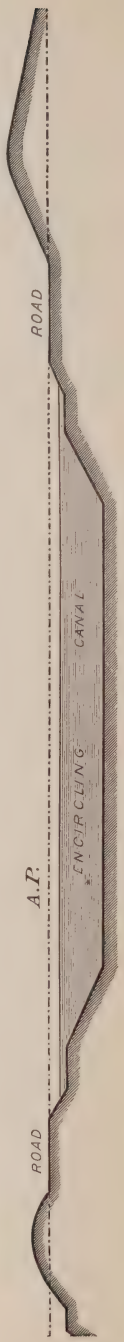

FIG. 8. CROSS-SECTION OF DIKES AND ENCIRCLING CANAL.

ered with turf, and has generally sunk but little, the heavy weight of the mass in construction having at once compacted it firmly.

In exceptional cases it has been necessary to restore its height from time to time, — generally with the silt taken out in cleaning the canal.

The narrow tongue of land separating the lake from the peat-lakes lying to the southeast of it was not land in the true sense of the word, only a narrow floating bed composed of a variety of aquatic plants whose roots were closely interlaced, and which rose and fell with the level of the basin. This was gradually loaded with the earth taken from the canal and sunk, little by little, to the hard bottom 12 or 15 feet below. Upon this, as it solidified, the body of the dike was finally built. The result was entirely satisfactory, and the cost was not excessive.

Occasionally it was necessary to build walls of fascines (sunken caissons), and occasionally heavy deposits of sand were brought at great cost from the dunes on the opposite side of the lake. This construction is shown in Fig. 9.

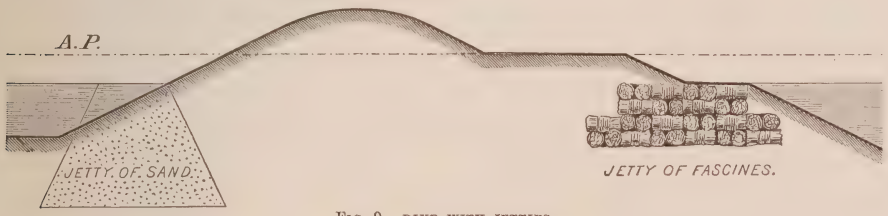

Fig. 9. DIKE WITH JETTIES.

In October, 1843, the lake was entirely closed, with the exception of certain openings left for navigation, and the final closing of which awaited the completion of the machinery and the consent of the Administration of the Rhineland. It actually took place only in May, 1848.

The dike and canal cost 1,938,328 gulden. Their length is 37.02 miles. The average cost for canal and dike together was 9.91 gulden per running foot. The superficial area of the canal is 654.36 acres, and the area of the dike and its slopes is 1,013.52 acres.

During the early stages of the work, before the dike had settled and become covered with vegetation, it was subject to considerable washing by the water of the canal, and had frequently to be protected by basket-work of straw and rushes.

After its completion, in 1848, it needed no repair save occasional slight additions to its height at certain points where it had settled or had lost material by accidental fires.

A curious phenomenon, however, occurred in connection with the outer dike of the canal on the east side of the lake, where it crossed an area of floating soil which bordered wide ponds near the village of Aalsmeer. An area of many acres, detached by the canal from the old works of defence against the lake, found itself one fine day driven by the tempest from the bank of the canal to the other side of the pond. The proprietor implored the aid of the Commission. His land had floated to the opposite shore, widely separated from his other fields, and resting on water that was not his own. By the combined effort of the proprietor and of the Commission these fugitive fields were towed back to the borders of the canal and pinned in place by piles and poles which prevented them from undertaking another voyage.

The question which required the most careful consideration, and the decision of which involved the greatest responsibility, was that of the exclusive use of steam-power for pumping. The amount of water to be lifted was over seven hundred and eighty million tons. To this must be added the rain-fall and the water of infiltration, which was estimated to amount to forty million tons per annum during the drainage of the lake, and to sixty million tons after the drainage. There had, however, to be taken into account the necessity for the rapid removal of the greatest additions the waters of the polder might receive under the most unfavorable circumstances. Provision was consequently to be made for the removal of forty million tons per month. The lowest water level of the canals and ditches after the draining would be sixteen feet — A P. This would constitute a task for the full capacity of one hundred wind-mills of the largest size. A serious objection to the use of these was found in the fact that a pumping wind-mill works effectively only one thousand five hundred hours in the year; the rest of the time (during the wet season) the wind is too strong, or too light.

In using wind-mills with the Archimedean screw, with which the lake

could be emptied in two lifts, of about seven feet each, it would have been necessary to have fifty-seven mills on each lift. The upper lift would have required fifteen months for its removal. The second lift could be moved only so fast as the mills of the upper could lift the water for the whole height of seven feet. This would have required for the removal of all the water of the lower lift thirty-three months. Draining by wind would therefore have required four years' time. Steam would be able to remove the whole in fourteen months, allowing an actual working of two hundred and fifty days per annum. Each wind-mill would cost 26,000 gulden, and would each cost 750 gulden per annum for maintenance, making a total, including interest, of 3,700,000 gulden.

It was calculated that the removal of forty million tons per month would be accomplished, with the use of pumps, by steam-engines having a combined force of 1,084 horse-power. In adopting steam as the motive-power, the Commission undertook an experiment larger than had ever before been attempted. There was no model to follow at home or abroad.

The experience of the mines of Cornwall had demonstrated that the larger the steam cylinder, — at least up to a diameter of eighty inches, — the less is the fuel required for the production of a certain force; that direct-acting engines with lifting-pumps give the most advantageous results; that such engines of eighty-inch cylinders can raise six hundred and fifty tons of water three feet high, with the consumption of twenty-two pounds of coal, being less than two and a quarter pounds of coal per horse-power per hour. Making allowance for friction and all draw-backs, there was allowed less than three pounds of coal per horse-power per hour.

The cost of draining by steam would be only 1,200,000 gulden. After the removal of the water, the maintenance of the one hundred and fourteen wind-mills would cost 74,100 gulden per annum. The steam-pumps (allowing fifty-three days' work per annum) would cost 54,000 gulden.

These calculations induced the Commission definitely to employ steam as their motive-power, and, in default of all example, they decided to create an apparatus which nowhere else existed.

As Hollanders had been called to England, to France, and to Germany for the construction of hydraulic works, they had no hesitation, born of national pride, in employing English engineers to prepare plans for their pumping-engines.

The duty was intrusted to Messrs. Arthur Dean and Joseph Gibbs, who contracted to furnish complete plans for a steam-engine with a double cylinder, the diameter of the inner one being eighty-four inches. Each engine should have a force of three hundred and fifty horse-power, with ten strokes per minute, the length of stroke being ten feet, and capable of raising from seventy to seventy-five million pounds one foot with the consumption of ninety-four pounds of coal of the best quality. They engaged further to superintend the construction and placing of the machine.

Their compensation was to depend mainly on the success of their plans. They were to receive 3,000 gulden, whether the Leeghwater succeeded

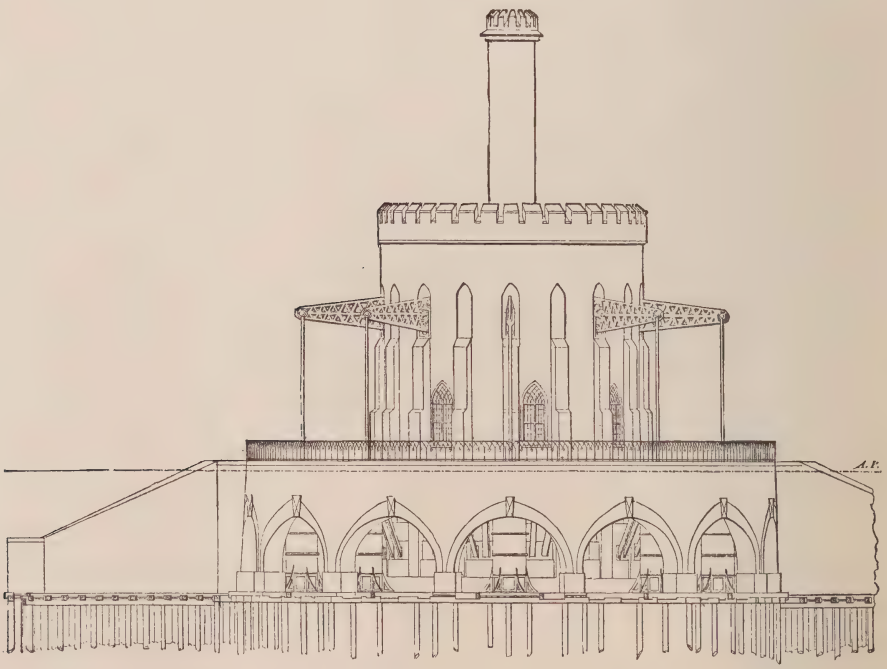

Fig. 10. ELEVATION OF THE PUMPING-ENGINE "LEEGHWATER."

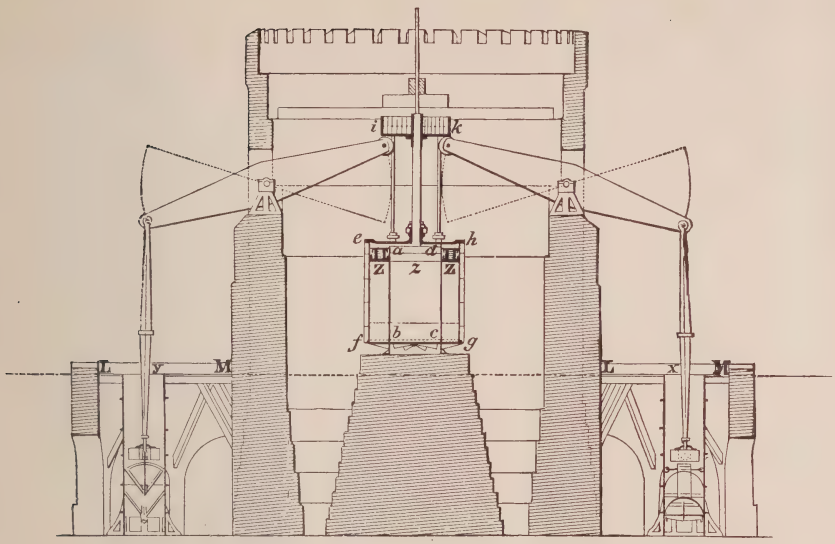

FIG. 11. CROSS-SECTION OF ENGINE AND PUMPS, "LEEGHWATER."

or not. To succeed, the machine should be of at least three hundred and fifty horse-power, and should lift from seventy to seventy-five million pounds to the height of one foot, with the consumption of ninety-four pounds of the first quality of Welsh coal, the circumstances being the same as would obtain when the water had to be lifted from the whole depth of the drained polder. This result being obtained, they were to receive, in addition, 9,000 gulden. For all greater result they were to receive 200 gulden for each million pounds in excess. The same plans being adopted for the Lijnden and Cruquius, they were to receive 9,000 gulden for each of these machines.

Fig. 10 represents an elevation and Fig. 11 a cross-section of the engine "Leeghwater" as actually constructed. The inner cylinder *a b c d* (84 inches in diameter) is placed immediately within the larger cylinder *e f g h* (144 inches in diameter). These cylinders have no connection at the bottom, — only at their upper parts. A solid piston *z* works in the smaller cylinder, and an annular piston Z Z in the larger.

These two pistons are connected by means of five piston-rods (one extending from the inner piston and four from the segments of the

annular piston) with a circular cross-head, to which they are securely fastened. This cross-head and the pistons themselves are heavily loaded with ballast as a counterpoise to the burden of water.

When the pistons are at the bottoms of the cylinders steam is admitted beneath the interior one; this is forced upward, carrying with it the annular piston, the cross-head, and the load of ballast; at a certain point the steam is cut off and the rest of the stroke is by expansion, until the pistons have reached the tops of their cylinders. During this time the plungers of the pumps descend by their own weight, and independently of the machine, to the bottoms of their cylinders, this movement causing the opposite ends of the working-beams to rise against the bottom of the cross-head. At this moment a valve is opened, allowing the steam to pass to the tops of the cylinders. The interior piston is then in equilibrium, with an equal pressure above and below; but the expansive force of the steam can act only upon the *upper* side of the annular piston, which it forces to the bottom of its cylinder, this force aiding that exerted by the dead-weight of the heavy apparatus, and of the ballast, in drawing down the inner ends of the working-beams and lifting the plungers of the pumps with their load of water. The return stroke being finished, the equilibrium valve is closed, the used steam passes to the condenser, and live steam from the boiler raises the piston for the succeeding stroke.

Each of the eleven pumps is sixty-three inches in diameter and has a stroke of ten feet, the amount of water lifted at each stroke being over 216 cubic feet for each pump, or over 2,376 cubic feet for the whole set, and, when running at full force, over 23,760 cubic feet per minute. The total product of twenty-four hours reaches the enormous figure of 34,214,400 cubic feet, or, 1,069,200 tons, for a single engine.

The water raised by the pumps flows directly upon a spilling-floor, L M. As soon as the water spread upon the floor rises higher than that outside, sluice-gates open of themselves and allow it to escape. This arrangement renders it unnecessary to lift the water materially higher than the level of the external canal, and gives a certain economy of force when this level is below its usual standard, constituting an important

advantage over the Archimedean screw (Fig. 12), which necessarily raises its water always to a fixed point, causing a useless expenditure of power when the outer waters are low.

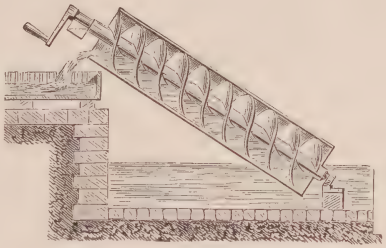

FIG. 12. THE ARCHIMEDEAN SCREW.

The pumps were so arranged that the engine could work to its full capacity during the early part of the drainage, when the lift was slight, and all the pumps could be operated together. As the level was lowered and the lift became heavier, opposite pairs of pumps could be detached successively, and at the lift from the full depth it was contemplated to use only three pumps.

The construction of the building to receive this machinery required the isolation by a circular dike of the spot intended for its foundation. This was drained and dug out to a depth of 23 feet — A P. At the bottom of this deep pit there were sunk 1,400 piles, 490 of them, of oak, being under the central tower, and soil was found so solid that it was impossible to sink them to the desired depth of 40 feet. Sometimes twenty-five blows of a hammer weighing 1,100 pounds moved them but the fraction of an inch.

The floor, composed of timbers rather than of planks, was secured to the tops of the piles, and on this were begun the enormous walls of the edifice. In three months two and a half million bricks were laid.

The walls were not less massive than the foundation. They were to sustain at their upper part not only the eleven working-beams in constant motion, each weighing 22,000 pounds, but also the rods and plungers of the pumps, and the torrents of water that these were to lift, — 48,400 pounds when at the depth of 3 feet, and more than 220,000 pounds at the lower limit of the drainage.

The first trial of the Leeghwater engine was made in September, 1845. Those parts of the machine which came from England were perfect in every respect, although several of them were of a size until then unknown. The steam cylinder was the largest in the world. This cylinder,

with an interior diameter of nearly 12 feet, and a length of nearly 13 feet, weighed 24.2 tons, the cross-head 18.8 tons. The eleven pump cylinders, 19 feet long and 63 inches in diameter, weighed 6.82 tons each. Having lain for a long time upon their sides, they had settled by their own weight, until they had lost one tenth of an inch of their circular form. They regained this after lying for some time in an inverse position.

When we consider the magnitude of this enterprise we readily excuse the president of the Commission and historian of the work for the enthusiasm shown in the following: "The enormous machine could at last be tried in September, 1845. It was a moment full of anxiety, but most imposing, when the colossus, put for the first time in motion, travelled off directly, — imperfectly, it is true, but it went. That which until now had existed only in the human mind had become a reality. This mass at once, as though animated, presented itself to our gaze in its magnificent *ensemble*, grand, simple, strong, unique of its kind, and working grandly. Until now the Leeghwater had been but an attempt; the attempt had succeeded. . . . . What would have happened if the attempt had not succeeded? The Commission would have been blamed and contemned; this would have been the consolation of those who had dared to compromise their names in the interests of a grand undertaking. But, further, we should have expended uselessly one and a half million gulden; the drainage would have been retarded and discredited beyond measure, the Dutch name would have been despised on every hand, where it is now, because of the success of the Leeghwater machine, honored by all who render homage to science and genius."

On the 6th of November, 1845, the Leeghwater machine in full action was presented to the King. The actual drainage of the lake was not commenced until two and a half years later; but an artificial basin was made, of the depth of 16 feet — A P, and work from the bottom of this demonstrated the efficiency of the mechanism.

In May, 1848, the lake had been finally closed, and the pumping was commenced with this machine alone, the other two not being ready for

work until April, 1849. During this whole period of eleven months the Leeghwater reduced the water level only $5\frac{1}{2}$ inches.

In the erection of the buildings for the "Lijnden," the contractor found so firm a foundation and such good material that a small pump worked by two horses was sufficient to keep the bed dry. At the "Cruquius," however, at a depth of 19 feet, he struck a bed of shells from which water and quicksand poured in on every side as through a sieve. He established and maintained in action, night and day, three pumps with sixty horses, and a six horse-power steam-pump. The deeper they sank the greater became the difficulty, until the caving in of the whole bank became imminent. Believing the case to be hopeless, he announced to the president of the Commission that he had ceased a work which insurmountable obstacles rendered impossible, and asked a discharge from his contract. The reply was: "All means are not yet exhausted; there is room on your encircling bank for a fourth horse-pump and a second steam-pump. The caving in can be prevented by sheet-piling. When these means have been tried and found insufficient, then, and then only, will *force majeure* be established. Until these have been tried the Commission cannot discharge you, and you will be immediately prosecuted for an abandonment of the work; but we will come to your aid, and will add 10,000 gulden to your compensation if you immediately apply the means indicated, especially the sheet-piling." An agreement was at once signed, and the next day work was resumed with unconquerable force and tenacity. The burgomaster of the city of Leyden furnished sixty additional men; the fourth horse-pump and a ten horse-power steam-pump were added. All this pumping apparatus, 12 immense pile-drivers, 450 workmen, and 83 horses were in full activity in and about the excavation. The top and slope of the bank were covered with sheds, shanties, stables, materials, forage; everything was in rapid action, — carting, wheeling, turning, drawing, and working, and all amidst the most cheerful songs and cries. While they gained slowly, inch by inch, on the rushing water, the twelve pile-drivers sunk the enormous piles of pine and oak. All this activity of movement, persistent, obstinate, apparently incoherent, yet perfectly regulated, — this mass of men and animals

gathered in so narrow a space in the midst of water and mud, — all worked together for the sole end of conquering, for a few moments, the effects of the natural law that leads water to seek its level. The skill and energy of man triumphed over nature. Soon 1,700 well-driven piles, 1,000 of them of oak, were covered with their heavy floor; the foundations were laid upon this, and the walls rose above the waves of the lake.

The construction of these two engines, with their pumps, varied in no material point from that of the successful Leeghwater, but some minor modifications delayed their completion, so that only in April, 1849, did they fairly begin their work.

Every part of the machinery, as well as of the buildings to receive them, had to be originated and constructed from theoretical plans only. Some parts were made in Amsterdam, and others in England, and the erection was done by mechanics of both countries, who had great difficulty in understanding each other until they had invented a Dutch-English *patois*, unintelligible to others, but quite effective for their own purposes, and which is still the language of the pumping-stations.

Although the dike was made very largely of peat, the amount of infiltration due to this cause was but slight. There were, however, developed, especially near the entrance to the Spaarne, several formidable streams of infiltration through porous strata lying beneath the canal. During the early years of the polder, before these channels had become choked with sediment, they had a sensible effect on the water level of polders lying beyond the canal.

An inspecting commission in 1860 reported that the drainage of the polder was improving year by year, and that there was no longer any serious annoyance from infiltration.

As has been stated, in April, 1849, the Leeghwater had reduced the level of the lake 5½ inches, and the real drainage may be said to have begun at this point (about 31 inches — A P).

From this time the lowering of the water was constant, except for

short intervals during winter, when the rise of the water in the outer basin required the pumps to suspend action. Early in July, 1852, the lake was dry. The whole time occupied was thirty-nine months, instead of fourteen months, as contemplated.

The amount of water lifted by the pumps, which made together over 14,000,000 strokes, was over 900,000,000 tons, nearly 50 per cent more than was originally contemplated. This excessive amount was due in a great degree to the infiltration, which, in all such work, is much the greatest during its early years, before the filtering beds have become filled with sediment.

The removal of this greater quantity of water; the time lost in awaiting the reduction of the basin to the level at which pumping was allowed to be resumed in accordance with the contract with the Rijnland; the occasional choking of the valves of the pumps by accumulations of silt; delay amounting in the aggregate to three months for each machine, caused by accidents to their parts; and the time required to excavate the canals by which the water was led from the centre of the lake to the different pumping-stations, — these all combined to prolong the work, the most serious consequence of which was the addition of a large amount of interest money to the cost.

The actual time of the *working* of the pumps was nineteen and a half months.

The completion of the drainage of the lake was celebrated by the issuing of several medals; the one struck by the government contained a Latin inscription, which may be thus translated: "Haarlem Lake, after having for centuries assailed the surrounding fields, to enlarge itself by their destruction, conquered at last by the force of machinery, has returned to Holland its 44,280 acres of invaded land. The work, commenced under William I., in 1839, has been finished in 1853 under the reign of William III."

In 1860 it was decided that the level of the water in the polder should not be allowed to stand higher than $15\frac{1}{2}$ feet — A P. The level of the lowest part of the land is 14 feet — A P.

The work of draining was not without its serious drawbacks. The Administration of the Rijnland was flooded with complaints coming from land-owners and the administrations of the polders concerning the bad effect of the work upon their established interests; petitions to the same effect were also sent to the Commission, to the King, to the States-General, to the Minister of the Interior. Some of these complaints were no doubt well founded, but too many of them originated in fears, misconceptions, or still worse motives. They related mainly to an undue elevation of the waters of the basin, and were met by the Commission with the general statement that the basin was no worse off in this respect than it had been before the closing of the lake; that serious dangers then existing had been removed; and that the means for accelerating the flow from the basin to the sea — the larger canal at Katwijk, and the engine at Spaarndam — more than compensated for the amount of water delivered into it from the new polder.

During the whole course of its work the Commission was annoyed by innumerable complaints from every side and on every ground. Some of these were well founded, and received attention, but the majority were either chimerical or malicious, though none the less perplexing.

Petitions, addresses, and complaints poured in incessantly, and divided the communities interested like petty questions of politics.

The delays that arose from all causes amounted in the aggregate to about six years, but still the 8,000,000 gulden appropriated for the work was not materially exceeded, so far as the items originally contemplated were concerned.

The lake had been pumped out, and the excavation of the minor canals and ditches had been begun in 1852, occupying the time until 1855, during which year the sale of the land was finally concluded. In 1856 the polder was given over to its new direction, but the pumping-machine at Gouda, the last item of the work, was not finished until March, 1858; one month later the Commission was dissolved.

In addition to the drainage of the lake itself, it was an important part of the plan of the Commission to establish steam water-wheels at Spaarn-

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dam and Halfway on the IJ to hasten the outflow of the water of the basin of the Rhineland.

These accessories were believed to be necessary to compensate for the lost effects of winds in driving the water toward one or the other of these outlets before the lake was drained. They must also be very important to the future interests of the polder, by keeping the Rijnland basin low enough for the pumps to be worked at all seasons.

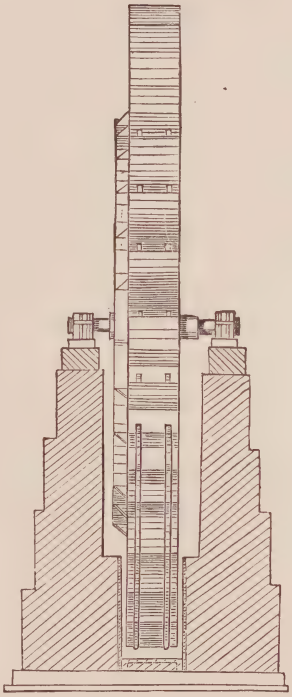


FIG. 13. ELEVATION OF DRAWING-WHEEL.

The principle on which these wheels operate is the same as that of the water-wheel used in wind-mill pumping, and shown in Figs. 13 and 14. The construction and arrangement of this apparatus at Halfway are shown in the accompanying illustrations.

The work of lifting the water is performed by a sort of reversed paddle-wheel, arranged as shown in Fig. 15, where the water is raised over a dam and discharged through valve-gates, opening into water at a higher level. When the wheel is not in operation, the water in which it stands falls back to the inner level, and the gates are closed by the pressure of the higher water without. When the wheel is set in movement it forces the inner water over the dam, lifting it to such a height that it opens the gates and flows outward.

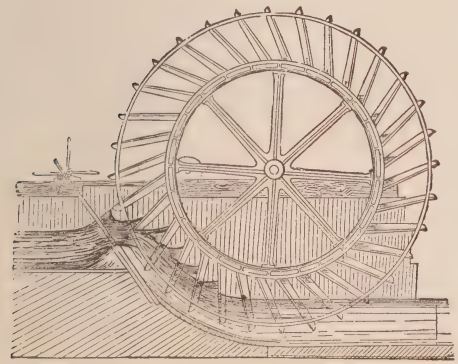


FIG. 14. DUTCH DRAINING-WHEEL.

A series of three of these wheels on axles, which may be connected so that they shall move simultaneously, is placed on each side

of the engine, as shown in Fig. 16, where the wheels at the right are obscured by the closed gates, and those at the left are seen through the open gate-ways. At the right of the building are seen the closed gates of a large sluice-way, which, in case of flood, opens to allow the free passage of the water as it passed before the engine was built.

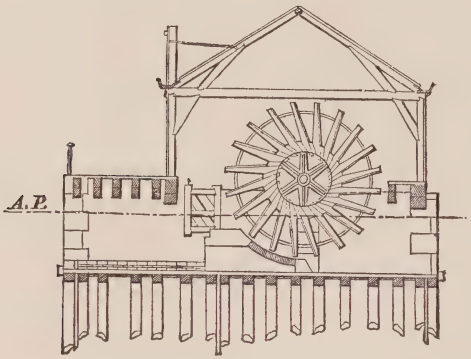


FIG. 15. SECTION OF WATER-WHEEL AND HOUSE.

Fig. 17 shows the location of the machinery and the sluices. Before the diking of the lake its waters flowed directly into the IJ through three sluice-ways, which are shown in the plan. Since the diking the canal has had the same direct communication that the lake had before the east sluice was given over to the Haarlem Lake Commission, which established dikes

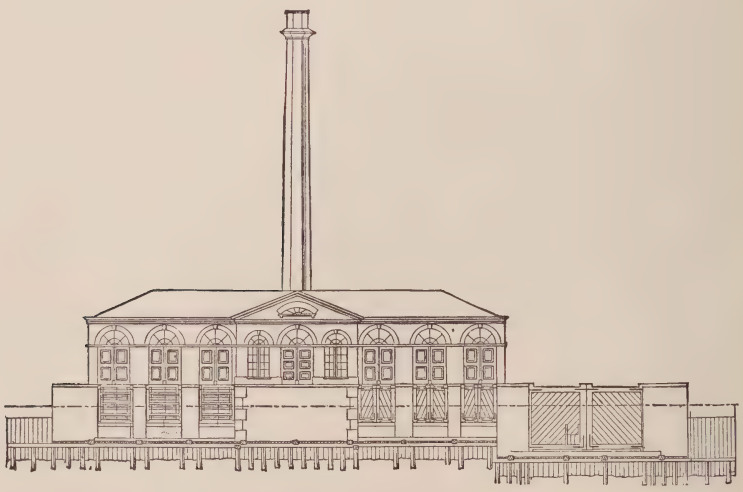


FIG. 16. ELEVATION OF STEAM-WORKS AT HALFWAY.

separating it from the fore-bay, closing the opening between these dikes with the pumping-wheels and the large sluice mentioned above. If for

any reason the engine is inactive, the east sluice receives its full supply of water through the gates provided for such emergencies. As soon as the wheels are set in operation the waters in the intermediary basin rise and close the gates toward the canal. When they have risen sufficiently they open the gates of the east sluice and flow into the IJ. Each wheel has a diameter of 21½ feet and a breast of 6½ feet.

The machine at Halfway ran, during its trial, 1,367 hours, and was in actual work, up to the time of its transfer to the Administration of the Rijnland, 3,623 hours; its consumption of coal was 787½ pounds per hour. Its average lift was 20 inches, and its total displacement of water was 202,765,406 tons, with a working force of ninety-two horse-power, and a consumption of 9 pounds of coal per horse-power per hour.

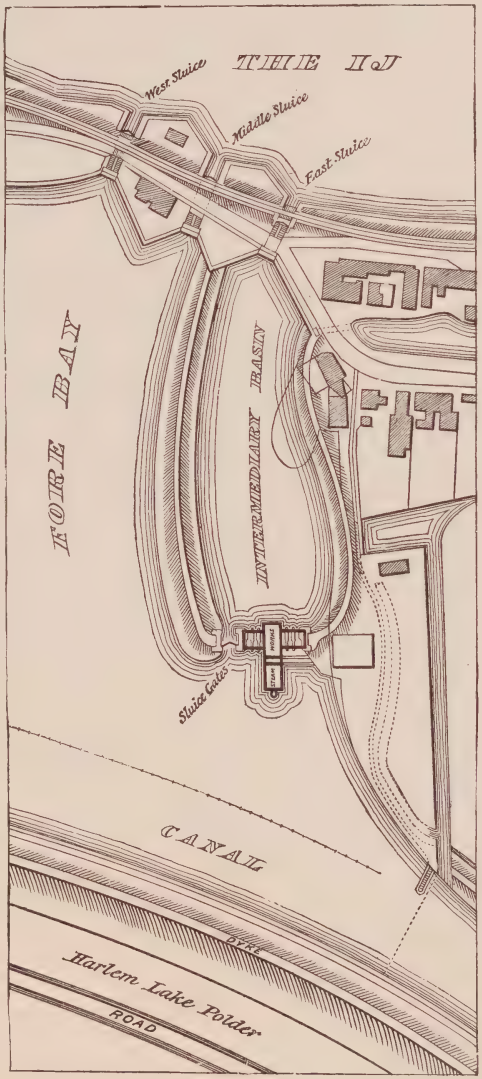


FIG. 17. ARRANGEMENT OF SLUICES AND MACHINERY AT HALFWAY.

The apparatus at Spaarndam is of about twice the power of that at Halfway. Its trial showed that the six wheels, having a united width of 45.92 feet, revolving for thirty-eight minutes, raised the level of the water in the test basin 25½ inches.

Two wheels were then disconnected, and four, with the united width of 32.8, revolving for twenty-seven minutes, raised the waters 12 inches more. A computation of the area of the test basin showed that, with the six wheels, 932.36 cubic feet had been raised per minute by each foot in width of the wheel, and that the four wheels had raised to the greater height 907.25 cubic feet for each foot in width of the wheels.

From the beginning of its work until the complete drainage of the lake in July, 1852, this machine alone threw into the sea 946,075,000 tons of water during 13,000 hours of work. This exceeded, by more than ten per cent, the whole amount of water thrown into the basin of the Rijnland by the drainage of the lake. The consumption of coal during the whole time was 7,480 tons, — about 1,150 pounds for each hour's work.

It was demonstrated, during the progress of the work, that the condition of the Rijnland would not be so satisfactory as to prevent complaint of the drainage of Haarlem Lake as a source of annoyance, unless measures were adopted to improve the outlet toward the south through the Gouwe Canal into the Ijssel, at Gouda. If there was any weak point left, this was it. Many projects were suggested, and much time was lost in considering plans and objections. It was finally determined to build at Gouda a steam apparatus with paddle-wheels, similar to those at Spaarndam and Halfway, to empty the water of the Rijnland into the river Ijssel.

The engine is of 120 horse-power, and the construction is similar, in all essential respects, to that at Halfway, except that there is no breast, or dam, in front of the wheels. Their action has the effect of pressing the water forward in a continuous stream, raising it to a sufficient height to open the sluice-gates and discharge into the river.

The average rise of the tide at Gouda is four feet + A P. To overcome this, the axles of the wheels are placed seven feet + A P. The wheels make but five revolutions per minute; they have each a width of $5\frac{3}{4}$ feet and a diameter of $24\frac{1}{4}$ feet.

The supply of fresh water to the polders in this part of the Rijn-

land is very important, and there is an arrangement by which the wheels can be thrown out of gear and allowed to turn freely, when water is needed for the alimentation of the polders, — it is then only necessary to open the flood-gates at the Ijssel, and allow the water to enter with no further interruption than the simple turning of these wheels.

A very important part of the plan of the improvement was that which related to the subsequent division of the land by means of canals and smaller ditches, these being needed not only to collect the drainage-water of the polder and convey it to the pumps, but also to afford means for local transportation in and among the farms, and especially to constitute the basin of the new polder, — that is, a sufficient reservoir to receive the water of the heaviest rains without allowing the land itself to be overflowed. Besides these canals and ditches, constituting the basin, roadways and bridges were also needed.

The plan for the division of the polder is shown in Fig. 18. This plan was made in advance of the drainage, after a triangulation survey and a careful series of soundings for depth, taken in winter while the lake was frozen. The soundings were made, not only to discover the lowest points of the bottom and secure their drainage by the shortest route, but also to determine the depth of peaty and other light material, which would be subject to depression or settling after the water should be withdrawn from it; this was especially important with reference to the establishment of a summer level of the water, which should be sufficiently lower than the finally settled surface to allow dry soil for vegetation.

The summer level was definitely fixed at $15\frac{1}{2}$ feet — A P, and the depth of the bottom of the canal at $19\frac{1}{2}$ feet — A P.

It was believed, and the result has shown, that, having in steam an accessory which may be applied at any desired moment, the basin might be materially smaller than in cases where it would need to hold the accumulation between sufficient winds, if wind-power alone is depended upon. For ordinary polders drained by wind-mills, from one tenth to one twelfth of the whole area is allowed for the basin. With efficient steam-pumps one twentieth is enough.

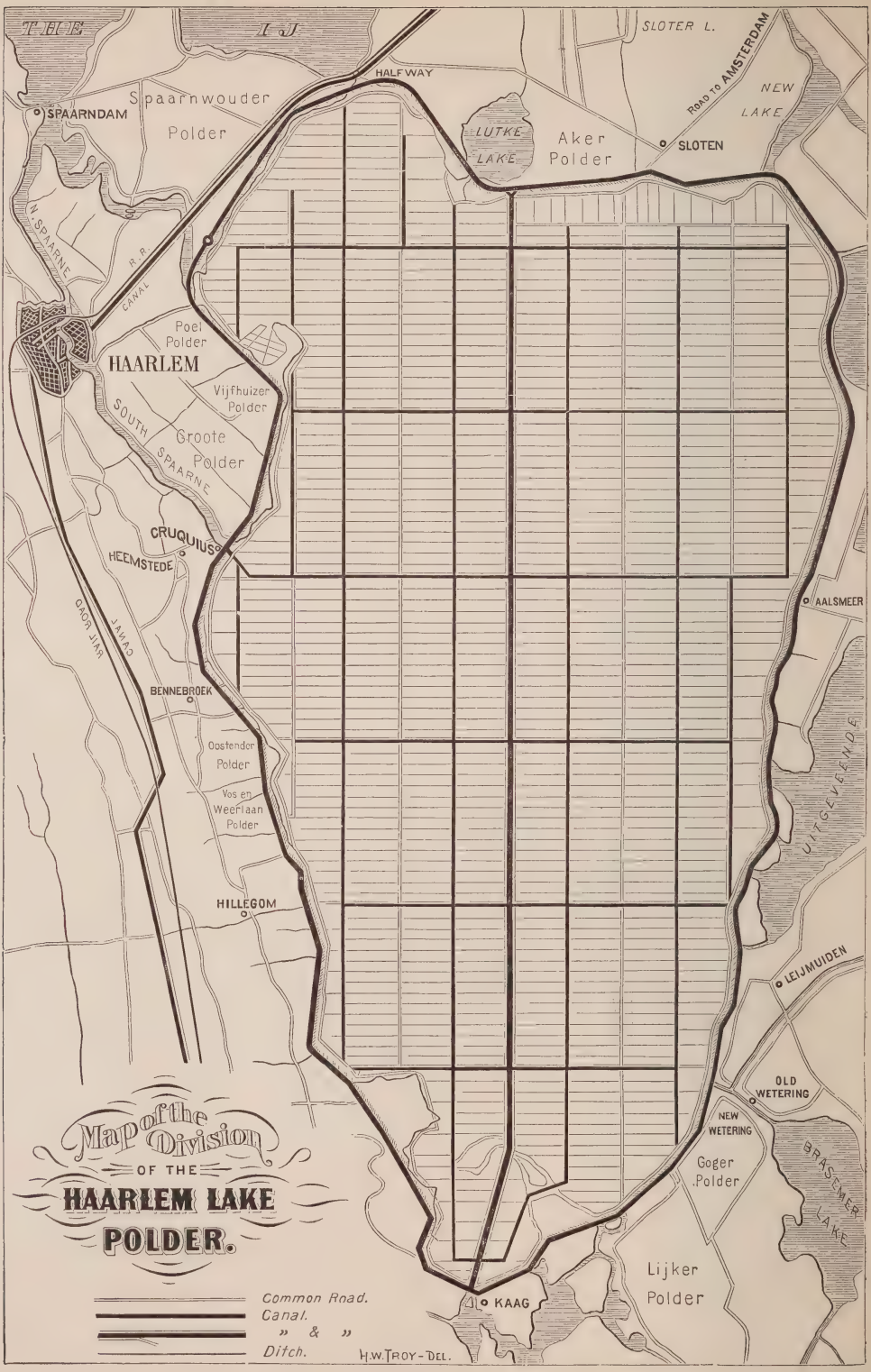

THE
I J
SLOTER L.
HALF WAY
ROAD TO AMSTERDAM
NEW LAKE
SPAARNDAM
Spaarnwouder Polder
LUTKE LAKE
Aker Polder
SLOTEN
N. SPAARNE
R. R.
CANAL
Poel Polder
HAARLEM
Vijfhuizer Polder
SOUTH SPAARNE
Groote Polder
CRUQUIUS
HEEMSTEDE
GROOT HAM
JAAGT
BENNEBROEK
Oostenden Polder
Vos en Weerlaan Polder
HILLEGOM
AALSMEER
UITGEVEENDE
LEIJMUIDEN
OLD WETERING
NEW WETERING
Goger Polder
BRASEMER LAKE
Lijker Polder
KAAG
Map of the Division OF THE HAARLEM LAKE POLDER.
Common Road.
Canal.
" & "
Ditch.
H.W. TROY - DEL.

FIG. 18.

By reference to the plan, it will be seen that a long canal follows the longitudinal axis of the polder in nearly a straight line from the Lijnden to the Leeghwater. Another crosses it about midway of its length and delivers at the Cruquius; these canals have a width of eighty feet. Besides these, there are four smaller canals lengthwise of the lake, and six crossing it. The whole area is further divided by smaller ditches into tracts of about fifty acres each.

The length of the large canals is 18.63 miles, and of the smaller, 93.15 miles. In addition to these, roads were established for a length of 122 miles, and sixty-five bridges were constructed over the canals.

The digging of the large canals had to proceed gradually as the water was removed, and the necessity for opening them to draw the water from the centre of the lake to the pumping-stations caused material delays in the general operations of draining. This work frequently employed 2,000 men.

For some years after the first completion of the interior water-courses frequent cleaning was necessary to keep them in order. The whole mass of earth in parts of the lake was still so soft that horses could only plough with broad wooden *sabots* on their feet, and the slopes and beds of the water-courses were difficult to maintain in good condition. In June, 1856, the basin was in sufficiently good condition to require no further expense on the part of the Commission.

The size of the polder to the interior of the encircling canal is 44,659 acres; of this, 41,648 acres are valuable land subject to taxation; the remainder is made up of roads and water-ways.

Canals and ditches have been dug for a length of nearly 750 miles, and roads have been made for a length of 133½ miles within the dike, and a tow-path of 37¼ miles adjoining the canal. The total length of water-courses and roadways is 919 miles.

When the polder had been divided by ditches into areas of fifty acres each, and it was proposed to sell the land, an offer was made by a foreign association to buy the whole for 120 gulden per acre. There were many objections to this, — an insurmountable one in the fact that those

who held the bonds of the drainage loan had the right to use these at par in paying for land to be sold when the work should be completed.

The first public sale took place in August, 1853, in that part of the lake over which the city of Leyden claimed ownership. In the midst of the crowd of buyers and spectators there appeared an officer of the court, who read in a loud voice the protest of the city against the sale, and threatened with prosecution any purchaser who might attempt to occupy his land. This was met by a guaranty of the government securing all purchasers in undisturbed possession.

At the last great sale of similar land which had been made it had brought 69 gulden per acre; a higher price was expected here, because of the close vicinity of several cities, and of the fact that many large proprietors in the neighborhood would wish to increase their domains. It had been hoped that 80 gulden would be reached. The foreign association had offered 120 gulden. To the great astonishment of all, this first sale brought an average of 298 gulden per acre. Some of the land subsequently sold was less advantageously situated and the prices were lower, but the average of the whole lake was 192.27 gulden per acre. The sum realized, together with the value of about 250 acres reserved for villages, etc., was over 8,000,000 gulden.

The basin of the Rijnland (the area to receive the water pumped from the polders), as has already been stated, was reduced to about one fifth of its original size, but no inundation of a polder has resulted from this. Many of them would have been drowned, as in 1836, if the broad basin had been in existence in February, 1860, when a fearful tempest reigned for twenty-four hours in all the land. Formerly, the huge lake, in prolonged storms, buried half the leeward country, filling entire polders, reaching into the streets of Leyden and Haarlem, or beating at the very gates of Amsterdam. The draining has rendered such disasters forever impossible.

The effect of the wheel-engine at Gouda has hardly been less important; it acts on the basin of the Rijnland by reducing the level of the Gouwe Canal, thus radically relieving all the polders which depend upon this for their outlet.

The cost of running the three steam-pumps during the four years covering the time of the drainage was as follows: —

Maintenance, repair, and improvements of machinery	80,120	gulden.
Attendance	61,875	"
Coal	229,426	"
Lubricating material	20,670	"
Total	392,091	"

The total cost of the work from its inception until it was given over to the Administration of the new polder in 1856 (not including interest and commission on the loan) was 9,377,512 gulden, divided as follows: —

Works for the discharge of waters from the basin of the Rijnland (wheel-engines, Katwijk Canal, etc.)	1,373,473
The encircling canal and dikes	1,988,257
Land purchases	684,513
Three pumping-engines, and the cost of maintaining and running them	2,405,433
Works connected with the navigation of the canal and Spaarne, etc.	196,815
Works for the defence of the capital by inundation	275,920
The division of the polders, roads, canals, etc.	1,325,828
Repairs, etc.	434,917
Expenses of the Commission, police, lawsuits, etc.	644,975
Expenses not provided for in the original estimate	47,381

Aside from the addition of this valuable territory, with its costly works, to the taxable capital of the kingdom, the following cash returns were realized: —

Received for rents, pasture-rights, sale of material, etc.	55,609
The sale of land, including the value of the small amount retained	8,032,781
Received from purchasers as pumping-tax	184,187
Received for fuel, lubricants, and work at the different pumping-stations, on turning them over to the polder and the Rijnland	72,415
Total	8,344,992

Leaving the question of interest out of the account (and much of this

was due to delays for which the Commission was not responsible), the net cost of the improvement was 1,032,520 gulden, or $413,008 gold, — less than ten dollars per acre for the land added to the taxable estate of the kingdom.

The historian of the work closes his account of the material gain to the state as follows: "But this is not all; we have driven forever from the bosom of our country a most dangerous enemy; we have at the same time augmented the means for defending our capital in time of war. We have conquered a province in a combat without tears and without blood, where science and genius took the place of generals, and where polderjongens were the worthy soldiers. Persevering to surmount the obstacles of nature, and those created by man, the country has accomplished, to its great honor and glory, one of the grandest enterprises of the age."

The Commission served long and faithfully without compensation. Its members accepted as a sufficient recompense these five words, inserted in 1852 in the Official Journal, "*Le Lac est à sec.*"

In my own visit to the polder, after examining Mr. Amersfoort's farm just within the dike, I walked along the tow-path of the canal to the pumping-engine at Lijnden, which is in charge of an English engineer, and which was even more stupendous than I had imagined. It works now mainly during winter with seven pumps, making seven strokes per minute, and lifting 56 tons of water at each stroke; the lift is 15 feet, 3 feet below the general level of the land in the polder. There are consumed about 29 tons of German coal per day. This engine, as well as the Cruquius and Leeghwater, works about three months during the year, day and night.

I went some distance into the lake, which yet has, as compared with the older polders like the Beemster, a somewhat new look, though, with a population of from 11,000 to 12,000 mainly devoted to agriculture, and with farms of small size, there is much more activity, more cultivation, and very much greater evidence of good farming than are to be found in new districts in our own country. There is, after visiting the older

drainages, nothing of special interest, so far as I was able to learn, except the immense initial fact of the reclaiming of this vast polder from the domain of the sea. Here, incidentally, one can best study the customs of the whole kingdom, for the inhabitants have come from every province, and each has built and does his farming according to the practices of his former home.

In this vast plain, so lately the bottom of a deep navigable lake, straight roads are bordered with trees; substantial and often elegant farm-houses are seen on every hand; over 30,000 letters are distributed annually; throughout the whole commune there are police, cemeteries, fire-engines, all the appliances of Dutch civilization, as well organized as in any of the older districts; periodical cattle-markets are regularly held; the diligence makes its stated trips; a steamboat plies on the encircling canal; grain-mills are at work, and all the necessaries of life are obtained within the polder. In the villages are artisans, manufacturers, and professional men of all sorts, — in a word, thrift, industry, and prosperity have taken complete possession of the polder.

Nearly opposite the Lijnden, on the other side of the canal, is the Aker polder of 738 acres, which is entirely drained and kept in satisfactory condition by a small wind-mill, which has been running for 250 years, driving a paddle-wheel that lifts the water about 4 feet. Each of the four sails of this mill is only about 22 feet long.

A little further on toward Halfway is the Lutke meer, containing 452 acres, lying $11\frac{1}{2}$ feet below the level of the canal. This is a new reclamation, and was pumped out in six months in 1864 by a centrifugal pump having a diameter of 18 inches, and delivering through a 12-inch iron pipe. This pump consumes 85 pounds of coal per hour, and the engine is of 12 horse-power. The polder is in good condition, but requires the constant working of the pump for seven months of the year.

The pumping-wheels at Halfway I was not able to examine, as, owing to the low stage of the water in the basin, their operation was not required.

At Haarlem I was fortunate enough to make the acquaintance of Mr.

van der Poll, the Dijkgraaf of the Haarlem Lake polder, who is the custodian of the documents and maps relating to the improvement, and is in charge of all matters connected with the removal of water and the protection of the works. From him I obtained much valuable engineering information.

The average annual rain-fall in the Haarlem Lake for ten years, ending in 1872, was	31.267 inches.
The average for the first four months of the year	7.472 "
The average for the second four months of the year	10.503 "
The average for the third four months of the year	13.292 "
The average work of the pumps was	5,584¾ hours.
The average for the first four months of the year	2,254¼ "
The average for the second four months of the year	398½ "
The average for the third four months of the year	2,932 "

The average annual consumption of coal was 2,690 tons.

If wind-power is used, it is necessary that one tenth of the area of the polder should be in canals and ditches (basin). If steam is used, the basin need be but one twentieth of the area.

For a lift of only 3 feet, it is immaterial whether the paddle-wheel or the Archimedean screw be used; either delivers ordinarily, with the large mills used, from 55 to 65 tons per minute.

The large wind-mills, such as are used near Rotterdam and in the Beemster, deliver as follows: —

11	tons	when	the	force	of	the	wind	is	from	10	to	20 lbs. per square yard.
25	"	"	"	"	"	"		20	to	40	"	" "
42	"	"	"	"	"	"		40	to	60	"	" "

The annual cost of draining the Beemster by the present system is 25,440 gulden. To drain it by steam would cost 56,575 gulden. The area of the Beemster is 17,647 acres. The extra cost, therefore, to drain it by steam would be 31,135 gulden, or 1¾ gulden per acre. The change is seriously contemplated, because under the present system, for an average of seven weeks during the winter, hundreds of acres are submerged,

while the other parts are only from 4 to 12 inches above the water-level. They should be never less than from 16 to 24 inches above.

Mr. van der Poll gave me the details of the canalization of the IJ, described in the first chapter (Hollow-Land). He states that the chief motive, that of perfecting a direct communication between Amsterdam and the sea, would hardly have been sufficient to induce the prosecution of the work, had it not been strongly seconded by the craving for the rich reclaimed land, which it is believed will lead to sales that will largely recompense its cost.

The ambition of the Dutch people to regain what the sea has taken from them will evidently know no limit until the solid defence against its incursions shall enclose only cultivated land and the canals necessary for navigation.

The drainage of the Haarlem Lake is by much the largest operation of its kind ever undertaken by man, yet it becomes almost unimportant as compared with the project now on foot for the drainage of the Zuyder Zee.

This improvement is to include the whole of the southern part of this body of water. It is proposed to build a dike from Enkhuizen to the Island of Urk, and thence to Kampen on the east coast, just south of the mouths of several rivers which belong to the outlets of the Rhine. This dike will be raised to a height of 16 feet + A P, — its width at high-water mark 131 feet. The dike will be covered with granite on its outer slope to a point well below the surface of the water, — laid at a very slight inclination, so as to break the force of the waves. The top of the dike is to have a width of nearly 20 feet, and the inner slope for a width of 29½ feet will rest upon a heavy stone and sand foundation. Adjoining these, a level space 33 feet wide will be devoted to a rail-road. Within these comes a canal 492 feet wide and 16½ feet deep. This canal will be in communication with the Grand Canal of Amsterdam. It will be separated by another dike with a long inner slope reaching to the bottom of the Zuyder Zee and bordered by a shallow canal 130 feet wide. The top of the dike will be 27 feet above the summer level of the inner waters. The whole area will be intersected by navigable canals.

The project was devised in 1866 by Mr. Bijerinck, Hydraulic Engineer of the Kingdom. It contemplates the draining of 480,000 acres by means of steam-pumps having a combined force of 9,400 horse-power. It is estimated that the draining will occupy four and a half years, and that the expense, including the construction of dikes, canals, interest, etc., will be 184,000,000 gulden, — each acre costing 1,050 gulden. The average depth of the Zuyder Zee is nearly 11 feet — A P.

Lest the reduction of the area of the Zuyder Zee should increase the rise of the tides during northwesterly storms and lead to the overflowing of the adjacent low country, the passage between the islands of Texel and Vlieland is to be diked, forming a barrier across the opening to the Zuyder Zee, which will very much decrease the influx of water. The Commission was unanimous in recommending the enterprise, on the score of health and of the general interests of the country, all previous drainages having proved advantageous. The whole scheme is now only waiting the approval of the government.

The earthwork required for the drainage of the Haarlem Lake was accomplished by men of a class called "polderjongens," who are to be found throughout the country wherever drainage is being carried on, operating in gangs, as sub-contractors, under the chief undertaker of the work.

They are men habituated from their childhood to the work, and to the life of the swamps and morasses, and hardened against sickness and fatigue; they are uniformly strong, robust, and active men, because the weak cannot stand the severe toil, and the indolent are driven from the gangs. They work in bands of from eight to twelve men, each band under its own chief.

The band lives in a hut made of straw and rushes, — light in summer and heavily covered in winter, — which is built in a few hours, and is taken down and rebuilt as the work progresses. A woman takes care of the house and maintains order; she is often the temporary wife of one of the men, the marriage being respected by all.

These men are provided with strong boots with heavy spiked soles, to give footing on the slippery planks over which they drive their wheel-

barrows. They are dressed from head to foot in red flannel. They live upon an abundant diet of pork, potatoes, and good bread. They sometimes drink beer, but more often tea or coffee, — seldom water. They are rarely members of temperance societies, and they end their hard week's work with a long carouse. At noon on Monday they return to duty, and for five days and a half work as long as there is light, often spending the evenings in dancing to the music of the violin. If their work is threatened with inundation even the night does not interrupt them, and if the summer is too short to finish their task it is continued in winter.

The main canal between the Leeghwater and the Lijnden was not completed until the last night of the year, when the opposite parties came together with mutual hurrahs; and these men of iron, covered with sweat and mud, in the open air, on a freezing night, in the midst of this immense plain of morass, prolonged their songs and their libations into the opening of the new year.

Viewed from the moral stand-point these polderjongens are not admirable, but one can but praise and respect the vigor, the efforts, and the courage of men who have made such enormous works possible. Early precautions were taken to provide for the treatment of those who might fall sick during the work of improvement, and pamphlets were written by scientific physicians prescribing rules to be followed. Much importance was attached to the planting of trees as a guard against malaria, but this was met by the proverb: "When the tree has grown the planter is dead." There was no time for precaution beyond the provision of ample hospital facilities. These, fortunately, were in little demand.

During the early stages of the work the acridity of the water in the ditches was so great that a single drop contracted the lips. After a short time the water became drinkable for animals, even in the lowest parts of the polder, where now one sees only broad grass-fields pastured by the finest cattle.

Care had been taken in the Haarlem Lake to make ample provision for filtered water, but the workmen rarely slaked their thirst except with cold tea and coffee; when water was used, it had always been previously boiled. Beer was not wanting, and they all had means with which to procure it. There were but few cases of fever, and few diseases result-

ing from excessive dissipation. At the worst season, among one hundred and eighty men working in the lowest part of the lake, under the most unwholesome circumstances, but two were ill when the medical officer made his inspection. Some years after the drainage, in 1858 – 59, after very warm summers, fevers were very general throughout Holland, but the new polder, and the adjoining country, were not worse off than the older drained districts. There was suffering everywhere, especially where the water, reduced below its ordinary level, left the marshy banks of ditches and canals exposed. The result was pestilential miasma, such as always exists under similar circumstances, not only in Holland, but in other marshy countries. The unhealthful conditions about the Haarlem Lake were considered only temporary, and were considered no sufficient argument against the execution of such work. The fear of malaria has never influenced the people against undertaking new operations of drainage. Under certain circumstances drainage enterprises have proved to be for the time disadvantageous, but most generally no ill effects have been observed. Were this not the case, what would be the condition of the provinces of North and South Holland, where nine tenths of the soil has been reclaimed from the sea?

After the drainage-work had been completed, the lake was formed into a new commune, which began its life with a population of several hundred persons, and twenty-five electors. Two villages were established in plan; one, being near the centre of the polder, and in its lowest part, had to be raised with sand to a sufficient height for safe building.

These villages were laid out, and their building was begun under the direction of the Commission. Streets and parks were provided, and two churches, one Protestant and one Catholic, were established for each community. Trees were planted at the sides of the streets and canals; but these were destroyed for want of a sufficient police. The northern village, especially, grew rapidly, and there soon appeared a doctor and apothecary, a mechanical bakery, a blacksmith, all manner of mechanics, and subsequently a fine school. The commune is now thriving and growing, and constitutes the best field in all Holland in which to study the various aspects of Dutch Farming.

CHAPTER III.

DUTCH FARMING.

UNDER what influence man first halted and took root on the submerged lands of Holland it would be difficult to determine. Certainly the agricultural attractiveness of the country could not have held him. The soil was one on which it was possible neither to walk as on the land, nor to navigate as on the sea. There were no materials for building; no iron, or other metals; no stone. The country seemed to the ancients like the vague end of the habitable world. There were only a few families, living on fish, and on the eggs of aquatic fowl, and taking refuge at high tide on artificial mounds, or in their cabins built upon piles.

Allusion has been made in previous chapters to various destructive floods, which made the chances of this country seem almost desperate, but the following account from Motley is so graphic, and shows so clearly the dangers to which the population was constantly exposed long after the general occupation of the country, that it may well be repeated here. He refers to the inundation of November, 1570:—

"Not the memorable deluge of the thirteenth century, out of which the Zuyder Zee was born; not that in which the waters of the Dollart had closed forever over the villages and churches of Groningen; not one of those perpetually recurring floods by which the inhabitants of the Netherlands, year after year, were recalled to an anxious remembrance of the watery chaos out of which their fatherland had been created, and into which it was in daily danger of resolving itself again, had excited so much terror and caused so much destruction. A continued and violent gale from the northwest had long been sweeping the Atlantic waters into

the North Sea, and had now piled them up on the fragile coasts of the provinces. The dikes, tasked beyond their strength, burst in every direction. The cities of Flanders, to a considerable distance inland, were suddenly invaded by the waters of the ocean. The whole narrow peninsula of North Holland was in imminent danger of being swept away forever. Between Amsterdam and Meyden the great Diemer dike was broken through in twelve places. The Hand-bos, a bulwark formed of oaken piles, fastened with metal clamps, moored with iron anchors, and secured by gravel and granite, was snapped to pieces like packthread. The 'Sleeper,' a dike thus called because it was usually left in repose by the elements, except in great emergencies, alone held firm, and prevented the consummation of the catastrophe. Still, the ocean poured in upon the land with terrible fury. Dorp, Rotterdam, and many other cities were, for a time, almost submerged. Along the coast fishing vessels, and even ships of larger size, were floated up into the country, where they entangled themselves in groves and orchards, or beat to pieces the roofs and walls of houses. The destruction of life and property was enormous throughout the maritime provinces, but in Friesland the desolation was complete. There nearly all the dikes and sluices were dashed to fragments; the country, far and wide, converted into an angry sea. The steeples and towers of inland cities became islands of the ocean. Thousands of human beings were swept out of existence in a few hours. Whole districts of territory, with all their villages, farms, and churches, were rent from their places, borne along by the force of the waves, sometimes to be lodged in another part of the country, sometimes to be entirely ingulfed. Multitudes of men, women, children, of horses, oxen, sheep, and every domestic animal, were struggling in the waves in every direction. Every boat, and every article which could serve as a boat, was eagerly seized upon. Every house was inundated; even the graveyards gave up their dead. The living infant in his cradle, and the long-buried corpse in his coffin, floated side by side. The ancient flood seemed about to be renewed. Everywhere — upon the tops of trees, upon the steeples of churches — human beings were clustered, praying to God for mercy, and to their fellow-men for assistance. As the storm at

last was subsiding, boats began to ply in every direction, saving those who were still struggling in the water, picking fugitives from roofs and tree-tops, and collecting the bodies of those already drowned. Colonel Robles, Seigneur de Billy, formerly much hated for his Spanish and Portuguese blood, made himself very active in this humane work. By his exertions, and those of the troops belonging to Groningen, many lives were rescued, and gratitude replaced the ancient animosity. It was estimated that at least 20,000 persons were destroyed in the province of Friesland alone. Throughout the Netherlands, 100,000 persons perished. The damage done to property, the number of animals ingulfed in the sea, were almost incalculable."

The coat-of-arms of one of the Dutch provinces shows a lion rising out of the waves, with the motto, "Luctor et Emergo." This device, indeed, might have been taken for the nation itself.

It was suggested in the preceding chapter that the flat country of the Netherlands grew from the accumulation of the sands of the sea mingled with the earthy deposits of the Rhine. A Dutch professor travelling in Switzerland found in the débris of the Bernese Oberland the same mica with which he was familiar in the silt of the Ijssel.

The frosts and rains and the wear and tear of the whole water-shed of the Rhine still enrich its floods with the silt out of which this vast polderland has grown, and the diminishing pastures of the higher Alps send their substance year by year to strengthen the foundations of Dutch agricultural wealth.

In the provinces of Friesland and Groningen, and all along the North Sea, on the alluvial soil, there are seen, at frequent intervals, little mounds, from 12 to 20 feet in height, on which the ancient villages were built. These mounds are called "terpen," and their erection has unquestionably been the work of man. When they are dug down, their upper parts are found to consist of layers of manure and rubbish, and they contain utensils which reach back to the bronze age, and perhaps even to the stone age. Carthaginian antiquities found within them indicate that at some remote time the hardy navigators of that nation must have landed on this distant shore.

These terpen were undoubtedly places of refuge for the people and their flocks during times of flood, if not the sites of permanent villages. The original structure was of clay taken from the neighborhood, — the depressions left having been soon filled with the silt of the floods, which were as yet kept back by no embankments. They consist of a calcareous clay, mixed with layers of manure, and have been impregnated with manurial matters for their whole depth by long ages of decay and filtration. Recently, their earth has been used with the best effect as a fertilizer. The material has now come in great request, and sells for 40 cents a cubic yard, about 35 cubic yards being a dressing for one acre. The use of the terpen material has caused almost a revolution in some branches of Dutch agriculture. The grass-growing farms farther to the south take this earth, and give in exchange fresh manure, to be used on the cultivated fields, — an exchange that would be practicable only in a country where water transportation reaches to the side of every field.

Since the days of the terpen-builders things have bravely altered, as is sufficiently shown by the description of the country travelled through, in the preceding account of the general aspect and condition of Holland. During a rapid tour, my opportunities for observing were of course very limited, but they were sufficient to confirm the impressions received from descriptions given by other and more careful travellers, and to satisfy me that I had nowhere else seen a community in which industry and prosperity, skill and success, went so constantly hand in hand. On every side there exists the most abundant evidence of comfort and civilization, — indeed, of an almost universal prosperity and a widespread wealth.

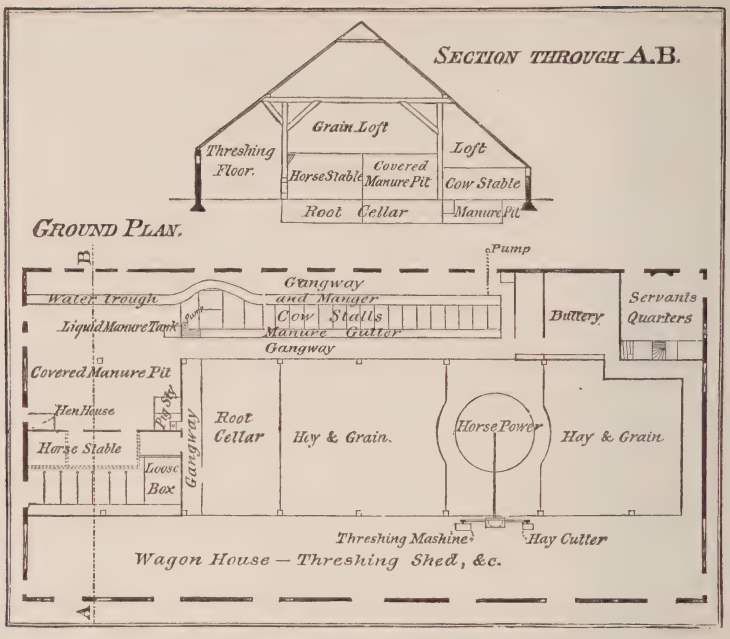
Laveleye speaks of the farm-buildings, especially in the northern provinces, as being of an unequalled size, and surrounded with evidences of wealth and taste. "Between the road and the dwelling-house there is a pleasure-garden planted with exotic trees, and whose lawns are interspersed with groups of flowers. At one side vegetable garden and fruit orchard furnish a good variety for the table. The house is imposing, with the great extent of its façade, and the large number of windows in the two stories. Within, the embroidered curtains, the furniture of American walnut, the piano, the books of the library, — these all indi-

cate large wealth and habits of life that imply a superior condition. Behind the dwelling of the farmer, but attached to it, rises a building, high as a church and long as a covered ship-yard. Here are found the cow-stable, the horse-stable, and the barn, all under one roof. On entering, one first sees an enormous space, sufficient to shelter the harvest of 200 or 300 acres, and a large collection of improved implements; next, sometimes 60 or 70 cows in a single row; and, again, from 10 to 20 superb black horses.

"The farmers of Groningen have preserved the simple manners of their ancestors. Although often possessing several 'tons'* of gold, they put their own hands to the plough, and take the immediate direction of all the work of their fields. They are much richer than their brethren of Zeeland and Friesland. Their sons are frequently educated at universities, a matter of no small cost, for in this rich country habits are fastidious, and it is estimated that each son while at college costs 2,000 gulden per annum.

"These farmers are the leading men of their country; there is no class elevated above them. From their ranks are chosen nearly all the members of the different elective bodies, and even those who go to represent the province in the States-General. The care of their farms does not prevent them from taking an active part in political life and in the duties of public administration. They follow not only the progress of the art of agriculture, but also the movement of modern thought. They maintain near the city of Groningen an excellent agricultural school with fifty pupils, and perhaps nowhere else is education so universal in country districts. In fact, Groningen passes for the most advanced province of the Netherlands. It is a sort of republic, inhabited by rich and enlightened peasants completely emancipated from the spirit of routine. One sees nowhere here the turrets of the feudal castle overlooking the trees of great parks, and one would search in vain for the aristocratic condition of which Brittany is so proud. The fine houses of the farmers are the only castles, and they all resemble one another. Property is quite evenly distributed, and almost all that the land produces remains

* 100,000 gulden.



PLAN OF BARN, ETC., ON A SMALL FARM IN GRONINGEN. — LENGTH 150 FEET; WIDTH, 72 FEET.

in the hands of those who cultivate it. Wealth and work are everywhere associated, idleness and opulence nowhere."

The mode of life is simple and inexpensive, and, since of late years butter and cheese have almost doubled in price, prosperity is greatly increased; but extravagant expenditure lies in the direction of treasure-storing, rather than in that of costly living. Many farmers, not content to have table service of silver, are said to use this metal even for heavy kitchen utensils. There are those even who are only satisfied with table service of gold. Aside from this, the accumulations of Dutch farmers are a very large source of the investment fund with which Holland is so well supplied for all manner of foreign stock-buying, and much of which has latterly taken on such a permanent character in connection with some of our own enterprises. One is surprised everywhere in the smaller towns with the number of the jewellers' shops, rich with sumptuous silver-ware, and, very often, coral necklaces of the finest quality, and worth hundreds of dollars.

Although Holland took its first impetus from commerce, this has sadly fallen away, and now agriculture has on all sides filled and overflowed the gap. Many towns, formerly thriving with commerce, have been destroyed by the silting up of their rivers and bays; but the reclaiming of the overflowed lands and ancient harbors has given them another and firmer hold upon prosperity, — a prosperity, too, which is much more general in its influence, reaching all classes of the community to a degree unknown during the old commercial days.

Agriculture in this country grew up originally only as an incident to the life of its mercantile people. The application of tariffs and the competition of England combine to lessen very much the importance of Dutch commerce, while the agriculture has steadily increased. Little by little, without attracting the attention of the rest of the world, and almost without the knowledge of Holland itself, the Netherlands have gone silently and quietly forward, until they have become one of the most advanced agricultural nations of Europe, exporting more of the products of the soil than any other; while the prudent, domestic habits of their forefathers, still prevailing among the whole rural population, cause their wealth to accumulate to a much greater degree than with any other agricultural people.

In 1860 there were sold in Alkmaar, 9,600,547 pounds of cheese; in Horn, 6,341,883.8; in Purmerend, 3,897,051.4; in Medemblik, 1,711,743; in Enkhuizen, 1,627,533.6.

If one will look at the map of that part of North Holland lying north of the IJ, comparing it in size with other districts of Europe, the force of this statement will be appreciated. The whole province of North Holland produces about 26,000,000 pounds of cheese per annum, and nearly the whole of this is made north of the IJ.

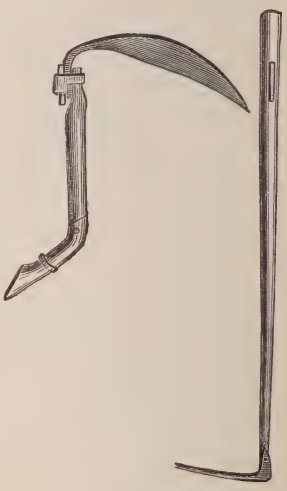
Other provinces are far from being behind this one in wealth of production. I have no statistics of the colza product of Groningen, but it must be enormous.

Zeeland is the richest in agricultural products of all the Netherland provinces. Of its 428,000 acres only 24,000 are unproductive; 196,000 are in cultivation, and 162,000 in grass. 45,000 acres produce an aver-

age of 23 bushels of wheat per acre; the annual product of the province is 17,000,000 gulden. *The average annual production of each acre of the cultivated land is about one hundred dollars of our money.*

The whole country seems, so far as I could judge, to be given to special local industries, more or less depending on one another. One of the most curious instances of this is to be found in the bee-keeping of some of the provinces. In order to take advantage of the flowering of the colza, which takes place in the earliest spring, but far away from the heather and buckwheat fields which supply them later, the hives are carried on boats or on long wagons arranged for the purpose. They may frequently be seen on the roads and canals of the Northern provinces, travelling to one or the other of their sources of supply. Their product is very variable, depending much upon the weather. In 1859, the province of Drenthe exported over a million pounds of honey; in 1860, it produced for export only about 10,000 pounds.

Old customs and old employments have maintained their hold with great persistency, and nowhere is there more of the thoroughly quaint and of the apparently awkward to be seen. The grain-harvest was in full operation during our visit, and I thought it a pity that there could not be a general introduction of our "grain-cradle." I described it to a farmer and urged it upon his attention as a great improvement; he was of a contrary opinion, and insisted that the hook and the sickle must be better. There is no use in arguing such a question with a prejudiced mind, but these tools appeared to me to be particularly awkward and inconvenient. The hook is held in the left hand and is used to push the grain along, toward the left, as it is cut by repeated blows of the long-handled sickle.



HOOK AND SICKLE FOR REAPING.

When enough for a gavel is cut, it is lifted aside by the sickle and hook together, and laid in its place. The swath is cut toward the standing grain, not away from it, as with us.

As has been before stated, an immense interest in Friesland and Groningen is based on the cultivation of colza, — a cultivation which must date back to the earliest arrival of the Germans, for the chaff of colza is found buried twelve feet deep in the terpen.

One of the curious customs of the country is connected with the threshing of this grain. It shells so readily that when once a stack is opened the threshing must be completed within the same day, requiring much more force than the farmer himself has at his disposal. The work is therefore done by travelling gangs, each under its own tesck-graaf or "Count of the Threshers." A huge sail-cloth is spread upon the ground, and the work is still inaugurated with some remnants of the ancient formalities that distinguished it. But, even in Holland, steam threshing machinery is driving out old customs, and it is no longer *de rigeur*, as it once was, that the tesck-graaf should immolate a ram with a knife decorated with flowers, his band devouring the flesh to the cry of *Ram! Ram!* that the girls who were to pass the sheaves to the threshers should first wash their faces in spring-water strewn with flowers; nor that, after the subsequent banquet, where the farmer and the tesck-graaf presided, and where strong drinking prevailed, — at the ball which closed the day's exercises, — the waltzers should turn, not round and round as is the modern custom, but over and over each other as they rolled upon the ground.

Another custom which cannot fail to strike a stranger is the universal water transportation for all manner of traffic, large and small. In the Beemster, all farm transportation is by water. It is by means of boats that manure is taken out and hay brought in, and that the milk is brought each morning from the pastures, where the cows pass the entire summer. Roads are generally used only for personal communication with the market-towns.

Not satisfied, as the rest of the world is, with comfortable housing and ample feeding for their cows, the farmers of Holland, as though eager to

recognize the all-important aid they derive from them, frequently cover them with linen blankets, tied in place, to guard them from the attacks of insects, and to shelter from the frequent raw sea winds. It is usual, too, to set up in the pasture-fields convenient scratching-poles against which the cattle rub their sides and necks with evident advantage. In several instances we saw the jaw-bone of a whale used for this purpose.

Domestic customs vary from the standard to which we are used as widely as do those of the farm itself, and the minutest detail that one is permitted to observe of the mode of life of the people is full of a strange interest.

At each farm-house and cottage in the drained district there is fixed at the side of the canal a curious kneeling-box, with a platform projecting out over the water, where the family washing is mainly done.

A BEEMSTER LAUNDRY.

The proverbial Dutch tendency for scrubbing prevails as much in farm-houses as in others, and adds to the attractiveness, as well as to the value, of the products of their dairies. Here, as elsewhere, the duty of repeated cleansing claims a large part of the time. In other countries, in the houses of workmen and small farmers, we usually see only the coarsest furniture, and untidy and worn utensils. In the Netherlands, even in the humblest cottages, all the wood-work is perfectly painted,

rubbed, polished, and dusted; utensils of copper and tin shine like gold and silver. There are few households which do not preserve some antique fragment of the time of the republic, 200 years ago, and porcelain from China of the same period.

Temple says: "From what they are able to spare, after the necessary expenses of the house, they use one part to augment their capital and revenue, and the other to embellish and furnish their houses, and, in this way, not only accumulate the fortune of their families, but contribute also to the beauty and ornamentation of the country."

The cow-stable is often in summer the show-room of the house; the one in which the most pride is taken. The little windows in the outer walls are covered with curtains of white muslin. The ceiling, and the partition separating the stable from the hay-barn, are of pine, glistening with cleanness. The floors of the stalls are covered with white sand, swept in fantastic figures. On tables and dressers are sometimes displayed pieces of silver-ware and old Japanese and Chinese porcelain, which have been carefully handed down from father to son for generations. Many of these objects are of great value, and would vastly delight an amateur. There are pots of flowers and well-polished implements, and everything about the great hall (for it seems more like this than like a cow-stable) indicates a combination of pride and of loving tenderness that bespeak an attachment to the home which one bred in a more beautiful country, and under a more genial climate, does not readily comprehend, when applied to the flat lands of Holland.

Dutch farmers have not been slow to realize the fact that good roads are important accessories to good farming, but it must have been a difficult problem which presented itself to the early inhabitants of a marshy country where neither stones nor gravel could be had. Fortunately, the prevalent clayey deposits make excellent bricks, — so hard that they ring like metal when struck together, — whence their name of "klinckers." The roadway is raised well above the level of the water in the adjoining ditches, graded to a proper form and paved with these little

klinckers (smaller than our bricks) set on edge. Grass grows to the edge of the roadway, and even in the spaces between the bricks. Its roots, doubtless, help to bind the whole together, and it grows luxuriantly from its frequent drenching with road-wash. There is no mud, and no dust. For light traffic, these roads could not be improved, and all heavy traffic goes by water.

In the low country, where wind-mills are largely used for all purposes, grain-mills are not specially dissimilar from the others, but on the higher lands, where, in country neighborhoods, the rude grinding of rye and barley is the principal work to be done, one sees only small mills, of which the whole structure turns on a pivot like the mere hood of the larger ones. One of these, into which I went, and which is the type of its class, is shown in an illustration of the first chapter of this series. In the Northern provinces hay is kept almost entirely in large barns, built in connection with the cow-stable and cheese-room. More to the South, however, what we well know as the "Dutch hay-cover" prevails quite generally. This is familiar to most of us as a square roof supported by four poles within which the hay is piled, the roof, supported by pins through the corner posts on which it rests, being lowered from time to time as hay is taken out or as it settles. These hay-covers in Holland are usually very much larger than with us, and frequently have a stable or wagon-house for a foundation. The roof, which is sometimes 20 or 30 feet above the ground, is well thatched, projecting far enough over at the sides to shelter the hay from driving rain. It is, apparently, not lowered, nor is the hay taken off the top, as with us. The first taking seems to be by a square cut at the side, near the eaves, carried far enough down to make a low doorway through which the hay in the interior is thrown out, the outer walls standing until the last of the season. The method is simple, inexpensive, and very convenient, and hay certainly could not be kept in better order than that in some two-year-old stacks which we examined.

No description of the Netherlands is complete which takes note only of the drained country which travellers chiefly see, and to which my own

observations were mainly confined. Our people generally are disposed to regard the whole kingdom as a reclaimed morass. On the contrary, more than half its area is high and sandy. Commencing at the south, in North Brabant and Limburg, the sandy region reaches with little interruption throughout the provinces of Gelderland, Over-Ijssel, and Drenthe, and passes on through Germany to the Baltic Sea.

I saw but little of this region, but whatever it has to offer of agricultural interest, however important it may be, must necessarily be of a different order from that which we find in the submerged countries. From the accounts that are available of its local agricultural practices, it must be very largely poor and unpromising land. To show how vastly different the sandy district is from the rich country of Groningen, I give Laveleye's account of the people of Rouveen and Staphorst in Over-Ijssel: —

"These are people of austere morals, strict and pious Calvinists, formal, adhering rigidly to all the ancient institutions in matters of faith as in matters of farming; and, for the rest, the hardest workers in the kingdom, adding to the cultivation of their farms several little industries which procure them a comfortable wealth. They weave baskets; with the wood of the elders, which form their hedges, they make shoe-pegs; they even knit their own stockings, and they have such a horror of idleness, that when the rulers of the village meet in council, they all bring their knitting with them. Rising before the dawn, they work bravely at the cultivation of their large fields, which often run in narrow strips several miles long. Up to this time they have resisted all innovations, even that of the chimney, thinking, like the farmers of Drenthe, that the smoke dries the grain, gives to the buckwheat a finer taste, and helps to preserve their pork and hams.

"A few years ago there was no modern building except the schoolhouse. There are no drinking-shops in their villages. In fine, notwithstanding their antiquated ideas and customs, these pure descendants of the ancient Frisians, who never marry out of their villages, are distinguished by severe morals, some education, a certain moderate wealth, few wants, and a great taste for work, which permits them to satisfy these easily."

The same writer thus describes the antique farmstead of Drenthe:—

"It is a vast wooden building, covered with thatch, with no interior division,—a sort of barn, where everything is united in the same space, the crops, the implements, and the family of the farmer. The horses are on one side, and the cows are on the other; between these run the pigs, the chickens, and the children. At one end a sort of cupboard encloses the beds. There is no chimney, and not even an opening in the roof. In the middle of the building a turf-fire is constantly burning, whose smoke escapes through the interstices between the planks, after having dried the sheaves of rye and buckwheat piled upon the cross-beams and quite to the roof. It is claimed that the grain thus receives an exceptional quality, which commerce apparently recognizes, for the rye and buckwheat of Drenthe are especially sought after."

Most of the country traversed in my journey from Amsterdam to Arnhem, and a vast extent of territory stretching away to the north and east of this line, is as barren and unpromising as any land that I have seen. It is covered, as far as the eye can reach, with purple-blossomed heather, interspersed here and there with meagre farmsteads and a few crops of the poorest description. It offers nothing instructive to the agriculturist. It is only as a matter of curious interest that the farmer cares to travel through this desolate region. He finds the whole agricultural attractiveness of the country to be concentrated in the artificially drained lands lying along the sea and the rivers.

One of my early trips was to the Haarlem Lake polder, just within the edge of which, near the village of Sloten, an hour's ride from Amsterdam, we visited "Badhoeve," * the farm of Mr. Amersfoort. This is a very fine, showy farm, large, and replete with all the appliances of improved modern agriculture, including Fowler's steam ploughing apparatus, steam threshing-machine, railways for conveying feed, and a perfect museum of minor implements.

Evidently, expense has been but little considered in arranging the

* "The Bath Farm," so called from occupying a former bathing resort of the people of Amsterdam.

whole establishment. The farm buildings are ample, well arranged, and of the best sort. The cattle and horses are as fine as could be asked, and all the appliances of stable and dairy are models of perfection. It is a superb example of "English" agriculture here in the bed of the old Haarlem Lake.

I could not learn that its proprietor makes any special effort at profitable farming, and probably the establishment is well worthy of the adjective "fancy." As an example of prudent, practical, economical farming, it is perhaps of not much value; but as an experimental farm, where all interested in farm operations in Holland can see and judge for themselves the processes most in vogue in the modern phases of the art, it must exert a very wide and beneficial influence. So far as I know, there is nothing of the sort in America at all comparable with it in any way.

The business of the farm lies largely in the production of butter, and of a peculiar sort of skim-milk cheese, flavored with cummin-seed. At the time of our visit forage was being cut by a large chaff-cutter, driven by one of Fowler's engines. From the machine, the cut fodder fell into a car standing on a track which leads to all the stables, turning at right angles into the different passages and gangways. At the turning-places the centre space is paved with large flat stones, and, as the short car is swung round the angles, the flanges of the outer wheels roll over the smooth surface.

In the dairy the milk is cooled in deep cans immersed in water, and is then stood to cream in large copper pans.

Mr. Amersfoort has taken a great interest in the drainage operations of the country, and has in his library a capitally made model in plaster of the bottom of the Zuyder Zee, showing its various depressions and the character of the soil. He is a firm believer in the wisdom of the vast enterprise for its reclamation.

The agricultural undertaking which has perhaps most interested foreigners, among all the well-drained and well-farmed polders of the country, is that of the Wilhelmina polder, in the province of Zeeland. In 1809, twenty-three merchants of Rotterdam bought from the State at

public sale, for 700,000 gulden, the marsh that had formed between the islands of South and East Beveland. The diking (which united the two islands) cost 550,000 gulden. This suppressed an arm of the sea, and reclaimed 1,068 acres. It is all rented to a single tenant, and constitutes one of the finest agricultural enterprises in the world. The surface is divided into regular fields of 25 acres by rectangular roads. The dikes, and about 250 acres of the lower and rougher land, are in permanent grass. All the fields are surrounded with hedges. Six sets of farm buildings are placed at regular intervals. There are model stables and barns of unheard-of size, large manure-yards, the best farm machinery of England and America, — steam threshers, clod-crushers, etc. The village of Wilhelminadorp is situated along the canal, near the centre of the polder. Its church, school, workmen's houses, and little shops are all well kept and in order. The live-stock is a cross between the Zeeland cow and the Durham bull. The surplus is sold at high prices to German farmers. The sheep are not less remarkable. Both beef and mutton are sold in the London market. The polder is drained by the receding tide. The rotation covers twenty-one years, and includes wheat, peas, beans, barley, flax, madder, oats, clover, beets, and turnips. The shares of the capital stock, which originally cost 18,000 gulden, were worth, ten years ago, 34,000 gulden, and paid six per cent on that price, notwithstanding that the profits of exceptionally favorable years were spent in permanent improvements, such as paving, draining, planting trees, etc.

In a late number of the English "Agricultural Gazette" there is an extended account of this polder, showing the minuteness and care with which all its accounts are kept, and the business-like way in which it is made to yield its utmost profit. It is there stated that Fowler's steam-ploughing engines (English) are now being used, notwithstanding the very low cost of horse-labor under the former very careful system of management.

That which most interested and instructed me in connection with Dutch farming lay in the old North Holland polder called the Beemster.

At Purmerend we called upon Mr. Schuitemaker, the leading book-

seller of the town. It is well for travellers to remember that booksellers, as a class, are intelligent and kindly men, from whom they are quite sure of a polite welcome and cordial help. He himself had gone to Amsterdam, but we found his son, who was in charge of the rather large and busy-looking shop, to be much interested in agricultural matters, and exceedingly polite in giving us information, and offering such counsel as he knew would be useful to us. By his advice we drove some three miles into the Beemster to the capital old farm of Wouter Sluis.

Mr. Sluis is a middle-aged, clear-eyed, wiry, Yankee-looking man, who spoke English sufficiently well for us to converse with him readily. He is of an old Beemster family, and his farm has been in cultivation since the first draining of the polder two hundred and fifty years ago. He is one of the good farmers of the region, but did not appear to be, nor did he claim to be, better than scores of others whose places we saw. In fact, the Beemster, which contains nearly 18,000 acres, pumped out in 1612, is one vast succession of strikingly good farms. The land lies at a uniform depth of 16 feet below the level of the sea. Its rim dike is over 20 miles long, and upon it are perched 54 pumping wind-mills of the largest class. As before stated, there are frequently weeks together in winter when much of its land is too nearly overflowed for the best results, and draining by steam is seriously contemplated, — at least the use of steam-power as an accessory during the wettest months.

At the time of our visit we found the farm force busy with a horse-power threshing-machine threshing out mustard-seed. Caraway-seed is also largely grown, yielding about 1,800 pounds per acre, and bringing about eighteen cents per pound. The land is divided as follows, the rotation occupying about ten years: 12 acres under the plough, 50 in meadow, and 66 in pasture. The meadows are also pastured after mowing. I was not able to get at the yield of hay per acre, but I should be very glad to see anything like such a mow full of fine, early cut, sweet-flavored, green-looking hay from my own 50 acres of meadow-land.

The stock carried by this farm — no food of any sort being purchased — is the best evidence of the quality of its soil. There were 25 immense Dutch cows, nearly as large as Shorthorns, but deep in the flank,

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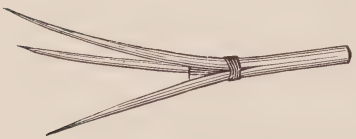
large in the udder, and with conspicuous frames, the type of great milkers; 20 similar cows, dry, and being fattened for beef; 24 heifers of two and a half years and less; 160 sheep, crossed with English Lincolns; 5 horses and 40 swine. I estimated the whole stock at the equivalent of 90 cows of the largest size.

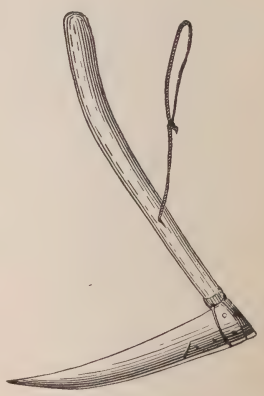
The cows are fed in the stable from about November 15th to May 1st; the rest of the year they are in the field day and night. The mowing is done between May 15th and July 15th. The cows give an average of sixteen to twenty-four quarts of milk per day. Four and a half quarts of milk make one pound of cheese. The bull was a fine specimen of the breed, quite as good as the best of those of his race in this country, where, on the "lucus a non lucendo" principle, and with our curious facility for calling foreign animals by their wrong names, — as they do *not* come from Holstein, and as their equals have never existed there, — they are known as "Holsteins"; just as Jersey cattle are called "Alderneys."



A DUTCH GRAIN-FORK.

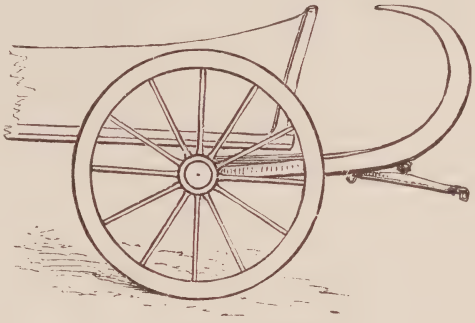
The threshing-machine, and many of the larger implements in use, are, as they are all over Holland, of English manufacture; but the ploughs, reaping instruments, wagons, and all the commoner utensils are of the true Dutch type; probably unchanged since the first civilization of the country.

The wagon, which was similar to all the common wagons we saw in the flat country, is a type of this thoroughgoing Dutch oddity. The horse is attached by a whiffletree to the under part of the hook which replaces the pole, and all that is asked of him is forward propulsion; there are few hills to descend, only the gentle slopes down from the dikes and bridges. When any holding back is necessary, the driver puts his foot against the horse's rump and makes his stiffened leg a substitute for breeching. One



A DUTCH SCYTHE.

foot is always resting in the forward part of the hook, and all turning to right or left is effected by a lateral movement by main force of this leg. My suggestion that the almost universal shafts or pole would be an improvement was received with a superior smile that can be equalled only in our own remotest farming regions.



A DUTCH WAGON-TONGUE.

The fields are divided by ditches, or, rather, by canals wide enough to accommodate a boat larger than an ordinary wagon-body, and all the interior transportation, except the spreading of manure when the ground is frozen in winter, is by water. During our visit the cows were being milked in a field adjoining the farmstead, but when they are farther away the milk is brought home in a boat.

The animals born and bred on the place understand the treachery of the slimy banks of the canals and keep at a safe distance, but the imported English pigs and sheep can never be trusted alone; several valuable animals have been lost by miring in the mud. In one pen we saw a Lincoln buck and five Lincoln ewes, bought from the flock that had taken the first prize at the Islington Show in London, in 1872.

A week later, in Rotterdam, I met Mr. Sluis about embarking for England to make further purchases of live-stock.

The water in the ditches stood about three and a half feet below the level of the land, as in the province of Groningen, but they were not so neatly kept, and evidently are more often flooded. Too little drainage was also indicated by the fact that the surface of the whole farm was ploughed into ridges or "lands."

I was especially interested to find that in showing his cows, and describing their merits, Mr. Sluis laid especial stress upon the escutcheon or "milk mirror," of which our ideas in this country are vague and tentative. He discussed the different "orders" and "classes" as shown in

his own animals, very much as an American dairyman would dilate upon those points which are here regarded as of especial excellence; not merely showing as good or bad those escutcheons which were large or small in their general area, but attaching great importance to the more minute details of the system of Guenon, whose illustrated Manual, translated into Dutch, he had, and had evidently thoroughly used. Both he and his son were very clearly of the opinion that all who question the value of the system are only smatterers, who seek for indications in general features which can be truly read only in details. Conversation with others in Holland and elsewhere in Europe made it seem clear that we have paid far too little attention to this means of determining the value of dairy animals.

After looking over the farm we were taken toward the house, and entered a large door leading into an enormous room, the like of which we had never seen. The walls were neatly whitewashed. The little windows were hung with white curtains. Along each wall was a pavement of clean brick-work, and next to this a whitewashed gutter; then came, for a width of about six feet, a flooring of handsome old Dutch tiles, well laid; then two rows of upright posts, the use of which was not at all obvious. Between these rows of posts was a wide passage-way leading the whole length of the hall. There were several tables, on which were bright utensils and some handsome articles of pottery. We congratulated ourselves on seeing the largest and cleanest dairy we had ever met with, but, on a second look, it seemed very large for a dairy, and the absence of milk, and of the evidence of daily use, led us to inquire the purpose of such a grand hall. We found, to our surprise, that we were in the cow-stable, which had been put in order for the summer. Except for the stanchions and tying-posts, and the gutter behind the stalls, there was nothing to indicate the use intended.

Like all Dutch cow-stables of the old style, this was in summer the show-room of the establishment. The tiles are considered a great luxury; but few families use them. Generally, their place is taken by neatly broomed white sand. The central alley is floored with bricks, and just in front of the tying-posts, on each side, there is a depression, or gutter,

also of brick. These are the drinking-gutters, which slope very slightly from one end to the other. Water is pumped in at the upper end, and is let off at pleasure at the opposite one. The cows stand on a raised earthen floor, supported by a brick wall at its rear end. It is this cattle-floor which is in summer covered with movable tiles; the manure-trough is quite deep, and contains the solid droppings until they are removed in a barrow. The urine flows off to the underground receptacle which collects all the liquid refuse of the establishment, and which has a pump for filling the tank-cart by which the meadows are sprinkled.

In the loft over the stable the cheeses are seasoned and prepared for market. Back of this part of the building are the cheese-factory, horse-stables, wagon-house, tool-sheds, etc. Leaving these, and returning through the cow-stable, we passed through a glass door into a sitting-room with some handsome articles of old furniture, and ample evidence of neatness and comfort. At one side of this we entered a little office or library, where we were shown handsome scientific books and various old objects of interest, and were requested to inscribe our names in the visitors' book, which had been well filled by travellers from all parts of the world. In the larger room, opposite the glass door spoken of, is a fire-place, and over this a large mirror. Here, Mr. Sluis showed us how he sits in winter toasting his shins before the fire, and looking up from his paper now and then to enjoy the reflected view of his two rows of fine cattle, which seem almost members of the family. We saw nothing further of the house, and I am therefore unable to refute or to verify the stories that are told of the absurd cleanliness which is said to be inseparable from Dutch housekeeping. So far as we did see, everything was neat and after its kind tasteful, and in good wholesome, humble order. The farmer and his son were not distinguishable in appearance, education (save in languages), or general intelligence, from the better class of New England farmers.

Off from one corner of the cow-stable is a dingy, cleanly, sweet-smelling room where the cheeses are manufactured by a burly bare-armed Dutchman, — clean in his person, and very active and business-like in his movements. The making of round cheeses, which we know as Edam

or Dutch cheese, is the great industry of all North Holland, and especially of the Beemster polder. Wouter Sluis's farm is probably as good a place as the world offers for studying a process which is sufficiently important, and sufficiently distinct from all other cheese-making, to be worthy of detailed description; it is the agricultural feature of Holland, which, after its drainage, is, perhaps, the most notable.

In the centre of the room stands a large tub on a three-legged stand. This is large enough to hold the whole product of each milking, which, immediately upon being brought in, is carefully double-strained into the tub. Its temperature varies, according to season, between 86° and 99°. When it is as low as 86°, the tub should be stood near the fire, and the doors and windows closed to prevent further cooling. When, on the other hand, the thermometer plunged into the milk marks from 95° to 99°, which happens only during the warmest summer weather, it is cooled by adding from two to four per cent of pure cold water; the best temperature seems to be for summer 89° to 93°, and for winter from 93° to 96°.

The conditions of straining and temperature being correct, there is added a certain quantity of rennet colored with a certain proportion of annatto; then, after stirring for a moment, the tub is covered. The amount of rennet to be used depends on the season, on the richness of the milk, and on the temperature; its determination is very much a matter of experience, and requires a skilled judgment.

When all goes well, the milk is curdled in from eight to fifteen minutes. If a longer time is required, a reduction of temperature interferes with the success of the work.

Much importance is attached to the amount of cream to be left in the milk. Too large a quantity makes the cheese too soft, so that it settles from its round form and fails to keep well. To avoid this during the latter part of the season, the milk is allowed to stand until one third, and, later, one half its cream has risen; this is removed, and the work proceeds as before described.

The curd having formed, it is cut in all directions with a curd-knife (a

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sort of gridiron), shown in Figs. 1 and 2. The strokes are first at right angles, then diagonally, and then circular, as shown in Fig. 3. This

FIG. 1. CURD-KNIFE.

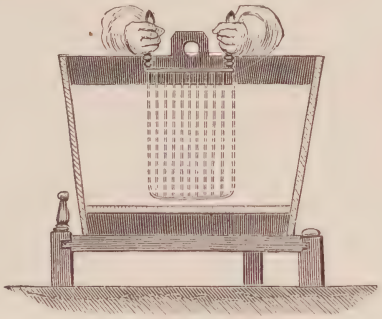

FIG. 2. MANNER OF USING CURD-KNIFE.

cutting is done as soon as the coagulation is complete and the mass homogeneous. Between each series of cuts — parallel, diagonal, etc. — two or three minutes are allowed to elapse. The cutting has to be managed with much prudence, for, if too rapidly done, it causes most of the butter to pass into the whey. Ordinarily, the cutting occupies from four to seven minutes. If the external air is too cold — say below 60° — the tub is covered after the cutting and allowed to stand two or three minutes.

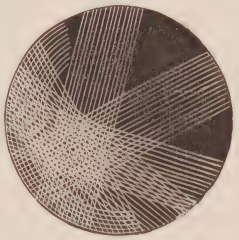

FIG. 3. MANNER OF CUTTING.

The curd is now reduced to a multitude of little crumbs, which settle to the bottom of the tub. These are now worked into a ball by means of a wooden bowl, which is worked slowly, parallel to the sides, for two or three minutes. If this is skilfully done the crumbs of curd, which have a tendency to adhere under the influence of the elevated temperature, form a compact mass, that is easily separated from the whey. This latter is first drained off from the top by the use

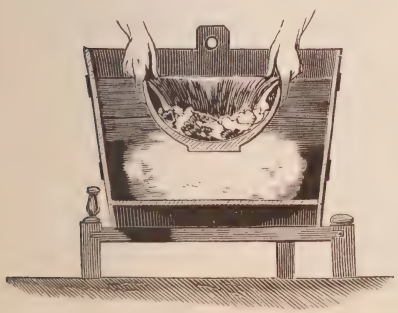

FIG. 4. DISHING OUT THE WHEY.

of a bowl, as shown in Fig. 4. When no more can be removed in this way, the tub is tipped on its edges, as shown in Fig. 5, and the curd is compacted by the hand into one mass, and is slightly pressed by the wooden bowl, in which is placed a weight of from thirty to forty pounds, as shown in Fig. 6. After five or ten minutes the whey pressed out in this manner is removed. This operation is repeated four times successively, from fifteen to seventeen minutes being employed in all.

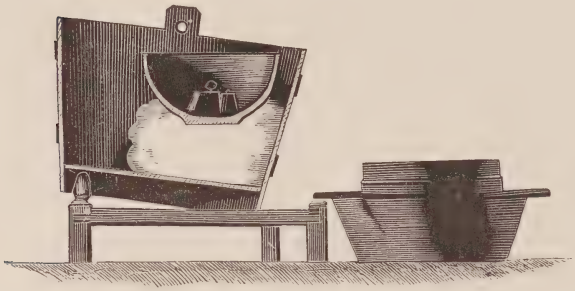

Fig. 5. DRAINING THE CURD.

The curd has now become hard, elastic, compact, and cracks slightly between the teeth, — in the condition, in fact, to which, in nearly all countries, curd for cheese-making is brought. The subsequent treatment determines whether we make Chester, Gloster, Edam, or other esteemed varieties.

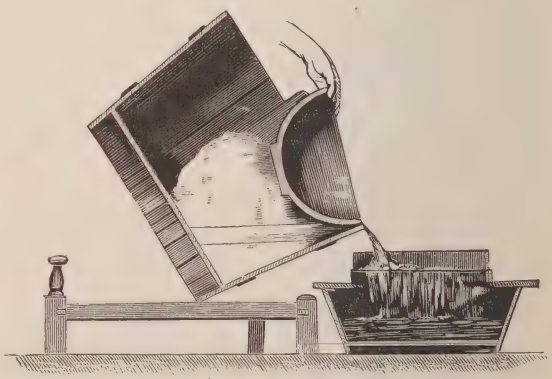

Fig. 6. POURING OFF THE LAST OF THE WHEY.

The operations now to be described are peculiar to North Holland.

The mould used consists of two parts, and is shown in Fig. 7. A couple of handfuls of curd are rubbed and kneaded with the hands until they are reduced to a soft unctuous paste, which is pressed into the bottom of the mould; then more is compacted in the same manner and packed on this, and so on until the mould is sufficiently filled. During the packing the mass is removed several times from the mould, turned, and

again pressed with the hands. This work should be very rapidly done to avoid cooling, which is always prejudicial to good manufacture. When sufficiently pressed, the cheese is plunged for one or two minutes into a bath of whey, raised to a temperature of 130° in winter and 125° in summer. It is again well pressed in the mould, and then is very carefully wrapped in a linen cloth, thin enough to allow the moisture to escape, and folded neatly about the ball. Mr. Sluis's trade-mark was made by a peculiar folding of this cloth, which made a star-like figure at the top of the cheese. The cap of the mould is now put on, and these are placed in the press. There are many varieties of cheese-presses in use, but all are simple, and will be sufficiently understood by reference to Fig. 8. The pressing is continued in the autumn

Fig. 7. CHEESE-MOULD.

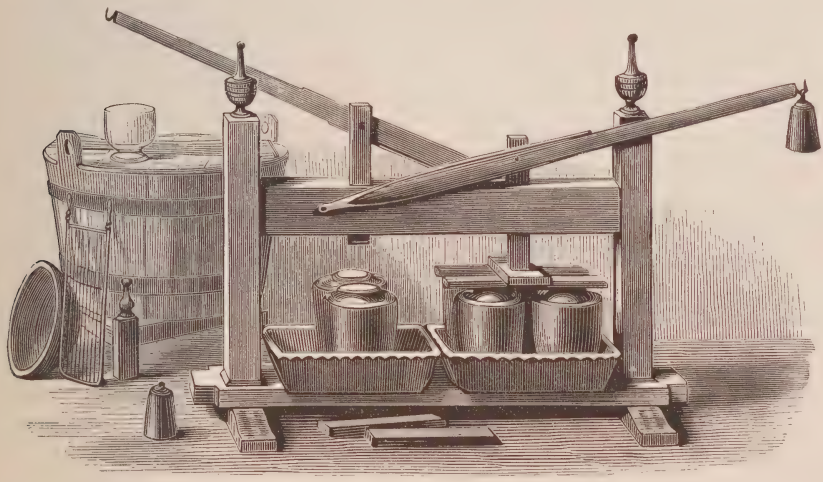

Fig. 8. THE CHEESE-PRESS.

from one to two hours; in the spring, from six to seven hours; and in winter and summer, about twelve hours.

When taken from the press, the cheeses are removed from the moulds, unwrapped, and placed in salting-cups, as shown in Fig. 9. They are then classed according to date, and placed in boxes disposed about the walls, Fig. 10. On the first day of their being placed in their moulds, a pinch of

Fig. 9. THE SALTING-CUP.

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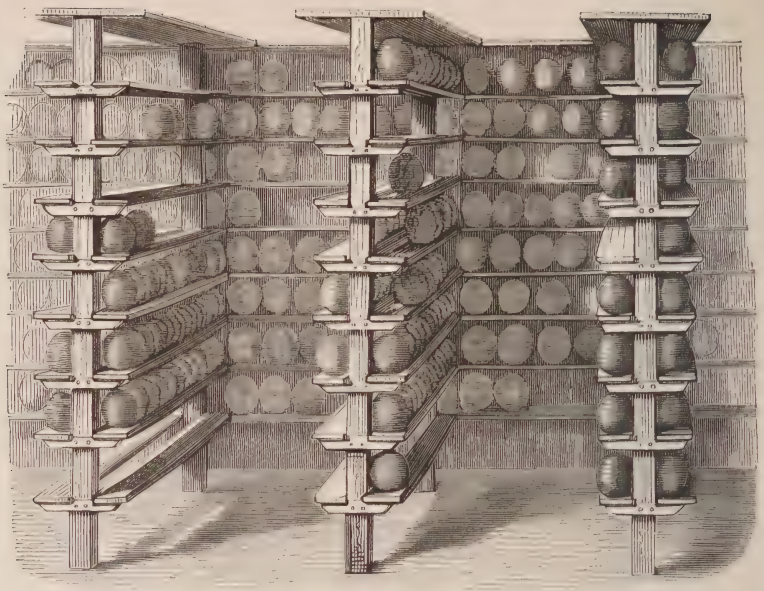

FIG. 10. CHEESES SHELVED FOR DRYING.

salt is placed at their top, and they are left until the next morning. They are then taken out and rolled in a wooden bowl of damp salt, and are then reversed in their moulds. This treatment is continued until the experience of the manufacturer shows that the salt has reached quite into the interior of the cheese, this having, in the mean time, lost its elasticity and become extremely hard. The salting lasts, on an average, from nine to ten days.

On being taken out of the salting-boxes, the cheeses are immersed for some hours in brine; they are then washed, dried, and finally placed on the shelves of the store-room, where, as in the salting-box, they are classed according to their ages, Fig. 11. This finishes the manufacture, strictly so called. The store-

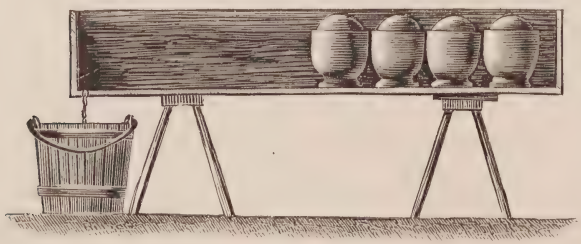

FIG. 11. SALTING-CUP TRAY.

rooms must be dry, wholesome, well lighted, and kept always in the cleanest possible condition; the temperature should never rise higher than 72°, nor fall lower than 45°. If it is necessary to open the windows in warm weather, special care must be taken not to allow an easterly wind to strike upon the shelves. Damp winds, fogs, and an unventilated atmosphere are all pernicious. If these precautions are not taken, the store-room is invaded by a golden-yellow mould which is extremely destructive.

The cheeses placed upon the shelves of the store-room are turned daily for four weeks; after that every second day. When they are from three to four weeks old, they are placed for an hour in pure tepid water (60° to 70°); are washed with a brush, and dried in the open air when the weather permits. As soon as they are thoroughly dried they are placed upon the shelves. Two weeks later they are again bathed, washed, and dried, and are well greased with linseed oil. They are then placed upon the shelves to remain until sent to market.

In Holland cheeses are generally marketed at the age of from six weeks to two months, and their subsequent treatment is at the risk of the merchant. If prepared for the foreign trade, they must be lightly scraped with a sharp knife that removes all the inequalities of their surface left by the mould, by folds of the cloth, or any other cause. As they come from the hands of the scraper, they are as smooth and polished as an egg. If they are intended for the English or Spanish market, an orange color is given to them by rubbing them with a few drops of linseed oil containing annatto. For France and some other countries, they are made red by rubbing them with butter colored with rouge.

A well-made cheese (before scraping) soon covers itself with a light, dry, mossy efflorescence of a greenish blue. This indication is much sought after by the Dutch merchants. It was very marked in some fine specimens which we brought home from Mr. Sluis's farm, and with which we frequently renew our recollection of the instructive afternoon passed there.

It was already twilight, and the swans in the ditches were nestling themselves away for the night as we drove from the farm and rattled

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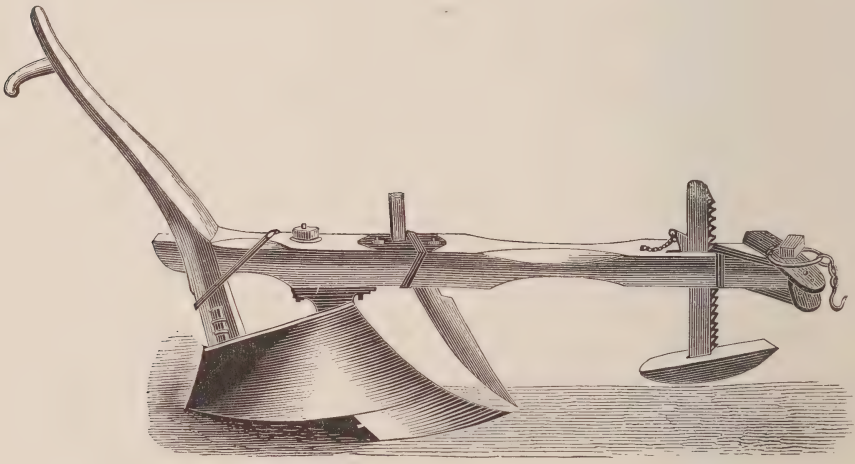
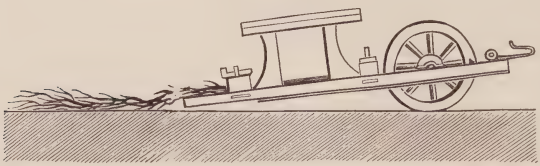
over the klincker road toward Purmerend. As we rose over the dike, a thin fog seemed to fill the Beemster to its brim; — seen in the dim light, it was easy to imagine the old waters returned, and all the life, activity, and prosperity, with which we had but now been impressed, to be a creature of the imagination. It was really easier to contemplate this vast hole in the ground as a filled lake than to realize the marvellous change that Dutch energy and ingenuity had wrought in it.

The plough used on Mr. Sluis's farm is similar to the one shown in the accompanying illustration.



AN IMPROVED DUTCH PLOUGH.

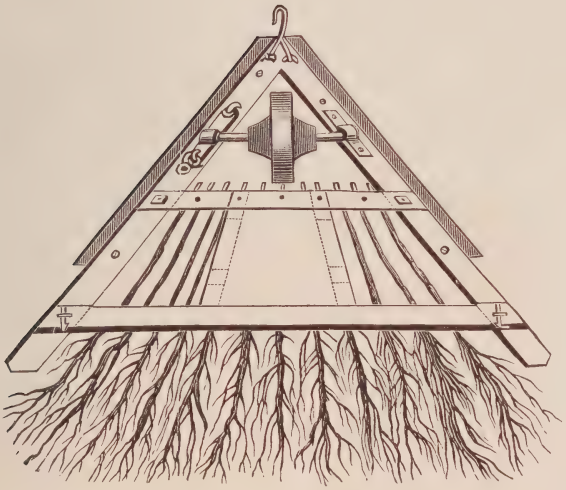
The implements employed by the best Dutch farmers are almost invariably English or American, but among those peculiar to the country there is a very good brush-harrow, which is better for the work for which it is intended than anything of the sort in use in this country.



SIDE VIEW OF DUTCH BRUSH-HARROW.

My examination and study of Dutch farming were all too short, and too much mixed with other sight-seeing (too vacation-like), to be of very great practical utility. They have produced, however, a strong convic-

tion that much more than a simple vacation tour would be well rewarded, and that there is no country to which an American farmer could give time and careful study with more real advantage to his practical operations at home than to this very Hollow-Land, where wealth is gathered as in no other agricultural region, and where, more than anywhere else, it remains in the hands of its producers, giving them a fuller measure of comfort, and even of luxury, than we at home are wont to associate with the idea of a farmer's life.



TOP VIEW OF DUTCH BRUSH-HARROW.

VIII

CHAPTER IV.

THE BIGHT OF LA MANCHE.

WE had rested for some weeks (if one can rest in Paris) in a snug little old-fashioned hotel, where the ancient Parisian traditions of cheapness and honesty, comfort and cleanliness, have escaped the demoralization of the war; a hotel too modest and obscure in its little back street to have been swept by the besom of American and Russian extravagance. We had rested and had considered our route. Between us and the Channel Islands, whither we were to go, lay such a wealth of invitation, that it became less a question of what we should see than what we could forego seeing.

Mont St. Michel, the marvellous, carried the day, and we took the early train down the valley of the Seine for Rouen. Once away from Paris, — whose influence ends abruptly at Versailles, — we plunged directly into the heart of agricultural France. Manufacturing France is fast encroaching upon it, and the route takes us

past many growing towns filled with the signs of busy industry, where tall factory-chimneys contrast rudely with odd-looking old church-towers; but the whole country-side is as old-fashioned and as foreign as though the only factories known were the village shops, where they make ploughs that look like wagons, and wagons that look like arks. The country people wear a dress that we rarely see, except near the emigrant landing-station at Castle Garden in New York; many women are working in the fields, and splendid gray Percheron horses, clad in broad collars

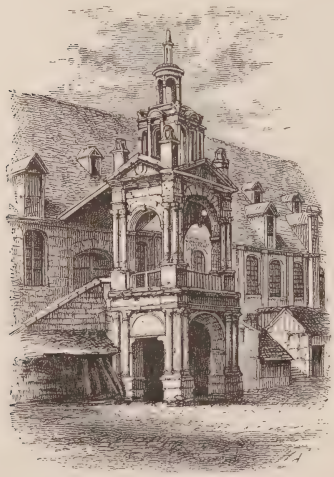
PLOUGHING IN THE VALLEY OF THE SEINE.

mounted with blue sheepskins, are slowly and stoutly turning a soil that has grown its yearly round of grass and grain to feed unnumbered generations of just such men and women and horses as now ply their peaceful art upon it, undisturbed by the harsh cry of progress, and almost unmindful of the ravages of the war which handled them so rudely, and of which they are now sweating to pay the cost.

No doubt "improved agriculture" has many a foothold in this fertile valley, but these instances are not conspicuous, and the impression on the rapid traveller by rail is simply that of a quiet and unspoiled farming country, adhering to the traditions of the olden time, and filled with a strange picturesqueness. It was on a day of bright sun and flying

cloud-shadows that we saw it, and as its well-kept fields lay guarded among the wooded hill-tops, and separated by the slow and sinuous Seine, with its freight of odd-shaped boats, it breathed to us the very essence of the novelty of a quaint old age.

Rouen, big and busy, sadly disappoints the arriving eye of the traveller. Ten chimney-stacks to one church-tower (fine though they be), and broad, handsomely built, Paris-like streets leading to the hotel on the quay, in front of which are the steamers and barges, and cotton-bales and drays of commerce, shock, with their nineteenth-century air, a mind prepared only for narrowness and crookedness and beetling top stories, and the richness of the most florid of all Gothic architecture, and the memory of the martyred Jeanne d'Arc. But picturesque Rouen is not all destroyed, it is only hidden. Many of the tumble-down old streets have been straightened and rebuilt; the light of day has been let in upon their pestilential recesses, and the regret of the hunter after the picturesque must be modified by his knowledge that his loss of temporary pleasure is offset by the permanent gain of the people in healthful and wholesome living. Still, many of the old streets remain, and enough of the storied beauty of the town is yet to be seen to make Rouen one of the sights of the Old World. Near the river, passing through an antique and angular street, past the curious "Fontaine de Lisieux," — built against the corner of an old house, in representation of the sculptor's crude idea of Mount Parnassus, and which has been flowing for 350 years, — we enter the "Place de la Basse Vieille Tour," a staircase and tribune attached to the Cloth-Market. From here one has a fine view of the towers and south front of the Cathedral of Nôtre Dame, on which is being built a hideous modern cast-iron steeple, in strange contrast with the beau-



LA BASSE VIEILLE TOUR, ROUEN.

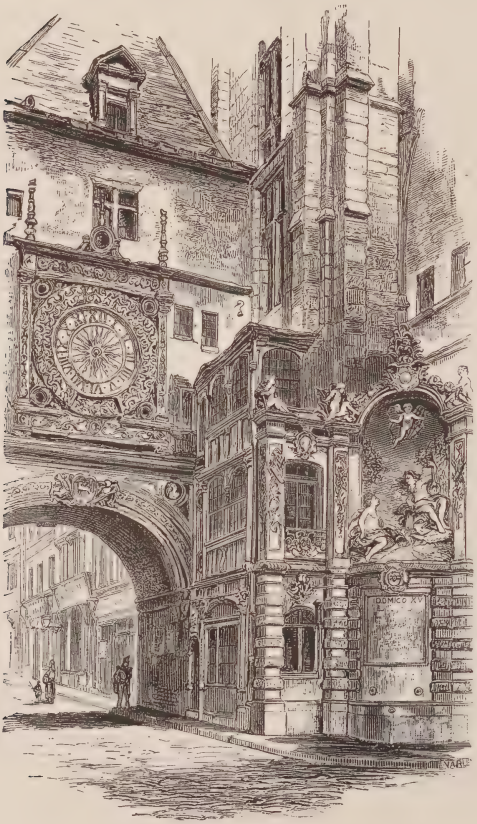
tiful time-worn sculpture for which this church is remarkable, — sculpture that approaches, as nearly as stone-work can, the delicacy of lace.

This church is of enormous size, — of which figures convey no adequate idea, — and its interior is worthy of the superb Gothic arches through which we enter it to gain a view of its harmonious proportions, and its decorations of sculpture, gilding, and colored glass. A highly unreverential sacristan, in cocked hat and gay uniform, marches us around the walls, drawling off his nasal yarn about the heroes and saints whose monuments it is his office to show, thumping his unwieldy mace on the stone floor as he walks, and intimating, in the broadest way, that all this interference with our quiet enjoyment of the holy place is to be "remembered" as we leave.

In spite of this nuisance, the Cathedral appeals strongly to all Cisatlantic Englishmen, — and most of us are English in the early training of our nursery rhymes and school histories, — for at the side of the sanctuary railing lies upon a tomb the recumbent statue of Richard I. of England, his lion heart, shut in a casket of silver, being incased in the stone. Here, too, lie the remains of his brother Henry. Throughout all this province one constantly realizes, as in the presence of these tombs, that the wave of our associations, which runs through English history, breaks at last on the hillsides of fair old Normandy, and the feeling comes that we are in the land of our own kith and kin.

In this church, however, as elsewhere in Catholic countries, there comes another element with which our Puritan-born nature is never in harmony: against one of the walls is the gorgeous monument of the Cardinals of Amboise, uncle and nephew, whose remains lie beneath, and whose fusty old broad-brimmed hats hang among the dust and spiders' webs high against the ceiling above. The monument — marble above and alabaster below — is rich to the last degree with symbolic sculpture. Behind the kneeling prelates St. George transfixes the down-trodden dragon, and under the shelf on which they pose stand six exquisite statues of Faith, Charity, Prudence, Force, Justice, and Temperance, beautifully cut little cowled monks filling niches in the columns between them.

If the Cathedral is fine, the interior of St. Ouen is almost finer, and the reflected view of its long, unimpeded, Gothic-arched aisle, with beautiful restored glass windows, as seen in the brimming holy-water stoup, is like a dream of an enchanted cathedral. St. Maclou, with its beautiful organ staircase, is equally remarkable in a way of its own. Another old church in the city (now used as a livery-stable) has a wealth of chiselled stone lace-work; and the Tour St. André, which has lost its church, recalls the Tour St. Jacques in Paris. And, besides these, there are churches and churches, until one wonders at the profusion of ecclesiastical richness. Nor is it by its ecclesiastical richness only that Rouen enforces admiration; the old Hôtel du Bourgtheroulde, built in the fifteenth century and used as a banking-house in the nineteenth, and overlooking the Place de la Pucelle, where Jeanne d'Arc was burned, is almost the most beautiful of mediæval buildings. The Tour de la Grosse Horloge, from which the curfew has rung for nearly five hundred years, with an arch over the adjoining street and a fountain of the thirteenth century, has no rival in Europe. The donjon tower — in which Jeanne d'Arc, in her military apparel and loaded with irons, was interrogated by the prelates, who condemned her to be burned alive — still stands, in suggestive proximity to the railway station.



TOUR DE LA GROSSE HORLOGE, ROUEN.

As an example of the old wooden-fronted houses characteristic of the

domestic architecture of the city, the Maison St. Amand is worthy of notice; and in contrast with it stands the Palais de Justice, which is, within and without, almost the perfection of Gothic and Renaissance building.

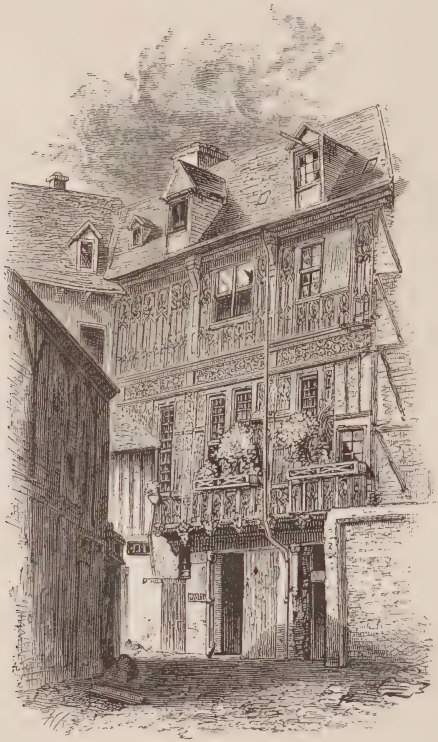
TOUR JEANNE D'ARC, ROUEN.

In hunting out these old historic buildings, one sees the best of what remains to the town of its mediæval character, and this was all that our hurried trip gave us time for.

After a halt of only twenty-four hours, we took the circuitous rail for Caen, a trip not especially noticeable or interesting but for the foreign look of the villages and the people, and especially of our fellow-passengers. At Caen, too, we had barely time to drive to the citadel, and to the beautiful, pure Norman Church of St. Stephen, founded by William the Conqueror and holding his remains, which were brought here for interment after his death in the Priory of St. Gervais at Rouen, whither he was carried after his curious injury. He was watching the conflagration of Mantes, when the wind blew a burning ember upon his horse's croup, making him plunge violently, throwing his rider against the high pommel of his saddle with such force as to cause his lingering death.

His queen, Matilda, lies in the fine Church of the Trinity, founded by her in 1066, together with an adjoining convent for the exclusive religious retirement of ladies of the bluest blood of the Norman aristocracy. Caen has been as crooked, and as tumble-down, and as filthy, as the fondest admirer of the antique could wish; but the railway has linked it to Paris, and a ship-canal has opened it to the sea, and here, as in all modernized towns, one must hunt for the traces of its old picturesqueness, — a hunt, happily, not difficult and well rewarded.

As the train leaves the station, it passes a grand level field in the Valley of the Orne, which is used for the annual races, and which still serves to illustrate the way in which, in feudal times, the lords of the land took the best of the earth's goods, and left the least for their poor retainers. The meadow is, in the latter season, a common pasturage for the towns-people's cows, — but only after the lord of the manor has cut and removed the hay-crop. Near the race-course are the world-renowned quarries of Caen stone.



HOTEL ST. AMAND, ROUEN.

One of the charms of European travel is to be found in the human nature with which one gets shut up in the small compartments of the railway carriages. We had for companions on this trip an avocat from Fécamp and a cotton-broker from Flers. The avocat was a robust and enthusiastic Frenchman of thirty, full of intelligence, but with a Victor-Hugo-like way of cutting his remarks into short paragraphs, and emphasizing his speech with capital letters. It was he who told us of the race-course grass-crop.

Belle Prairie!

Propriété particulière, pour le Foin!

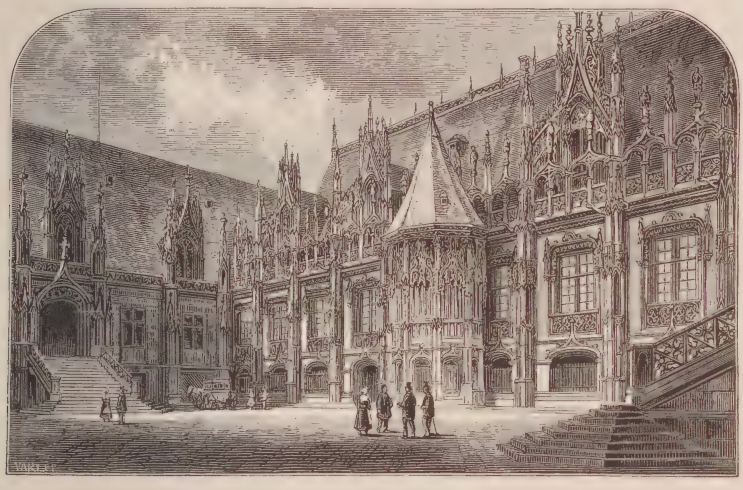
Propriété commune pour le Regain!

Un richard prend l'abondance!

Grand nombre de Pauvres prennent ce qu'il laisse!

In this way he jerked out much interesting information, especially

about the agriculture of Normandy, and the character of its peasantry and country families. His speech was purely suggestive; he impelled



PALAIS DE JUSTICE, ROUEN.

one's thought in a certain direction, and then kept it in its course by a little pat on one side or the other, as he saw a chance for it to swerve away from his purpose, giving it a fresh impulse now and then by a vigorous new suggestion. He rode with us less than an hour, but he left an impression — which will always remain as a pleasant feature of the memory of our few weeks in France — of a thoroughly French, but thoroughly original and intelligent observer.

The cotton-broker was of the owly sort. An air of mystery clad all he said. In telling us about the connection of the trains at Flers, he said we could depend on him, and he furtively intimated for our assurance, "Je suis de la localité," drawing himself back with an inquiring and important air to see the effect of the statement on our minds. Perhaps the reader has never heard of Flers; we knew little of it ourselves, — the little the guide-books tell of an entirely modern cotton-weaving town of 10,000 inhabitants, with a fine church of the last decade. Our travelling companion knew little else, and cared for little else. Paris was his model, of course, for he was a Frenchman; but the degree to which Flers rivalled Paris in all the elegances and conveniences of liv-

ing, and in its sanitary arrangements, — none of the details of which did he spare our ladies, — it was remarkable to hear. The individuality he gave to this insignificant town, as we travelled toward it in the dark, did much to fill with interest a part of our journey which would otherwise have been reeled off with the listlessness with which travellers are too apt to smother the waysides of the railway intervals of their wanderings.

We reached Flers after dark, and had to wait for the corresponding train from Paris. We could see nothing of the town, but it will not suffer by being left in our recollections with the unverified glow our companion gave it, and with the charming impression we got from its station restaurant. Why, — O, why can we not have such civilized food, such service, and such surroundings, at least at the stations of our largest towns ?

Writing a year after the event, and with my recollection clouded by the intervening memories of numberless ten-minutes-for-refreshments fly-boxes into which I have had to rush since coming home, — to scald my tongue with hot chiccory, and to do that still greater violence to more vital organs which the hurrying in of "depot" food involves, — I can give fewer details of the buffet at Flers than I should be glad to give.

My impressions are very distinct, however, of a moderately large and pleasantly lighted room, with a very clean floor, neat tables (not crowded), spotless linen, and shining cutlery, silver, and glass. Opposite the door was a large side-board backed by a broad mirror, in which were reflected the chandelier, tumblers, and wineglasses of such brightness as one does not always find in a gentleman's dining-room, and a noble bunch of pampas-grass flowers, — as fresh and soft as feathery cream. A neat maiden, behind a neat and well-stocked counter, made up packets of lunch and bottles of wine for those who preferred to eat leisurely on the road, and well-trained (and well-dressed) waiters served those who chose to sit at table, — as we did. I remember that we began our supper with the excellent bouillon which greets and cheers the French traveller at every turn. What followed it, and how much it all cost, have blended themselves in my mind with so many other grateful reminiscences of

cheap and excellent fare at railway stations in France, that they can no longer be detailed. Nor have I the statistics with which to prove that the same food served in the same way in America would pay the lunch bar-keeper so well as he now gets paid. I am, however, quite clear that were the Flers man to set up his establishment at the station in Springfield (Mass.), and to charge Massasoit prices, the Massasoit House — which has probably the best railroad-table in New England — would have to reform its cuisine and its service, or it might soon go for a shoe-factory.

Our further journey was short, and we reached Villedieu-les-Poêles late in the evening. "Hôtel de la Poste," said the guide-books, and to the Hôtel de la Poste we went. At last Paris and its influence were behind us, and we were in the heart of old, old, unspoiled Normandy. A cheerful landlady came clattering in her sabots to welcome us into the old stone-floored kitchen, ceiled with blackened oak and heavy beams, from which hung strings of garlic, hams, and other imperishable stores. At the farther end, in a generous old fireplace, the "pot au feu" hung from the crane over a handful of blazing wood. On the walls were shining coppers; in one corner was the curtained bed of host and hostess, and in another, a similar retreat for the two blooming handmaidens; a tall clock ticked against the wall, and old mahogany dressers and chests of drawers, clean, and with polished brass, shone in the light of the fire. At the side of the fireplace was a clock-work jack (moved by a ponderous stone weight at the opposite side of the room) to turn the roasting-spit, and in the window-seat was built a many-holed stove of tiles for cooking with charcoal when the company becomes too numerous for the capacity of the hearth. Everything was old and clean, bright, warm, and thoroughly homelike; and the people were cheery and kind. It was a pity to go to bed — but it was also amusing.

Two little narrow beds, with clean, crash-like linen sheets; a table, with one diminutive bowl and pitcher, and two chairs, were the furniture of the small double room, which was pervaded with a fragrant odor of fresh hay. Opening the door of what seemed a closet in the wall, we came directly upon the hay-loft of the stable part of the house.

Our sleep was frequently interrupted by the bells of the incoming and outgoing diligence horses, and the clatter and gabble that forms so large a part of a Frenchman's idea of driving. In the early morning I went out to look at the town. It was entirely foreign, of course, but it was also entirely *triste*, and we found all the villages on our route to have this character. Gray stone houses, with slate roofs, an entire absence of front gardens, and of all color and brightness, and a very dead-and-alive air over the stolid faces of the people, impressed us at every turn of this part of the journey with a feeling we least of all expected to have in France.

But what the villages lack the country makes up for, and as the rickety old diligence (diligent as a tinker's ass-cart) crawled slowly out of "la riante Vallée de la Sienne," — bells jingling, whip cracking, driver whistling, yelling, stamping his feet, doing all that one man could do to frighten two horses, — and as sunshine and shower chased each other over hedge and apple-orchard, field and wooded hill-top, we sat in dreamy delight in the snug old calèche-topped banquette, almost questioning whether we were really we, and whether there really was any America; whether all the world was not a land of sabots, white cotton nightcaps, green hedges, greener ivy, floor-like roads, and noisy, lazy diligences.

We climbed to the tops of long, high hills, and rolled to the bottoms of far-away fertile valleys, and everywhere the life and the still-life of the country were redolent of a familiar novelty; all was strange, but so harmonious, and so exactly as it should be, that it seemed only strange we had not known it before. It was plain to see how a Norman peasant finds, in the dull content of his native land, a home-like, happy stolidity that no emigration could improve, and why he holds as he does to the old home of his fathers.

Midway of the route our horses, having grown callous to the boisterous demonstrations of their driver, were freed of the knotted clothes-lines and scant leather of which Norman harness is made up; and another pair, whose nerves had had a night's recuperation, were tied in. The old driver, hoarse with ten kilo of yelling, was replaced by one whose voice was fresh from his morning's bouillon and thin cider; and we rolled noisily on our way again.

Toward noon we came out on the high bluff overlooking the richly cultivated Valley of the Sée, across which, at the seaward end of another like it, stood the high-perched town of Avranches. To the right, and far away, in the very focus of a gleam of sunshine, Mont St. Michel, rising from the golden sands, and backed by a fringe of rolling surf, broke upon us for a moment in its full glory, and then faded into the shadow of the gathering clouds, losing itself entirely as we dropped into the low-land, and rumbled on past the little farms and overloaded cider-orchards which lined the well-kept way. The country of La Manche is a land of moss-grown thatch; every house, every cottage, every hut, snug under its thick mat of straw, is bronzed and gilded, and made green with every variety of moss that rotting straw, a genial sun, and frequent fog can grow, — all blending so well with field and hillside, that the buildings almost seem to have taken root, and to have drawn from the soil itself such harmony with its other growth, as to make their human origin seem doubtful, and to justify the motive for the conspicuous assertion cut deeply into their door-lintels. "Built in 1672, by order of André Le Brun, and Jeanne Vittré, his wife," was the longest we saw.

As the zigzag road turned for a second pull up the steep hillside, we saw coming toward us, through the light rain, a little procession, headed by a priest in black robes, bearing a cross, and others chanting a requiem; acolytes, in scarlet gowns, one swinging a censer, walked at the sides of the road, and in the centre was carried the bier of a young girl, — maidens in white bearing the pall, and one following with a cushion on which lay a wreath of flowers. After these came the few mourning relatives and friends. Sadly and slowly they wound round the turn of the road, and the dull refrain floated softly to our ears after they had gone from our sight.

At the top of the hill we turned clattering into Avranches, and into the dirty stable-yard of the Hôtel de France, — at a little side office in which presides probably the most mendacious and tricky of all diligence agents. By dint of shrewd negotiation we ingeniously arranged with him the most expensive and uncomfortable way possible to get ourselves to Pontorson, and our heavy baggage to Dol; but even this was not accom-

plished without an amount of mutual invective that rankles in our memories to this day. The agents of these lines must have begun life as diligence-drivers. In no other school could they have been so trained to senseless, noisy gabble.

Having an hour to wait, we went out to see the town. Avranches is not much to see, but it is a superb place to see from. Perched high on the point of a commanding hill, it overlooks a beautiful foreground of Norman fields and farms, and has Mont St. Michel and the Tombelaine in full view. Behind these stretch the waters of La Manche, and to the left is the far-away blue coast of Brittany. It is considered one of the healthiest and pleasantest towns of France, and has many economical English residents. Aside from its view, it has only one small lion, — the stone on which Henry II. knelt to receive from the Pope's legate absolution for the murder of Thomas à Becket.

Two hours, through a charming country and a pouring rain, brought us to Pontorson, and we were dropped at the Hôtel de la Poste, where the rascal at Avranches had told us we should find a "correspondence" for Mont St. Michel. Whatever may be the natural disposition of "Veuve Le Roy et Fils," they had found seven hundred pilgrims, who had gone that morning to the island, in addition to the regular travel, too much for their nerves. They scouted the Avranches man's suggestion of "correspondence." They would, perhaps, let us go for one night if we would take return tickets for the early morning voiture. We wanted to stay until the afternoon. At this both *mère et fils* grew pale with rage, clutched at the air, and swore round oaths. Would we go now and return in the morning, yes or no? Did we own the horses and vehicles, that we should say how we should go? Would we go, or would we stay? "It is nothing to us; come, now, yes or no — and done with it!"

Fearing an apoplexy, we suggested delay, and that we would see what could be done at the "Hôtel de l'Ouest" over the way. Fils followed us into the street with loud imprecations — now, or not at all. If we dared set foot in the "Ouest," we might walk to Mont St. Michel and back again, — voila!

The "Ouest" could do nothing for us, — not a horse was left in the

stables; everything had gone with "les Pélerins." In despair we sought the apothecary of the village; was there no way to get to the island, and was there a good hotel if we must stay here? O, yes; chez Madame Le Roy you will find good vehicles and an excellent hotel. Evidently humble-pie was our only safe diet, and back we trudged, to find other travellers, come by a later diligence, in violent row with the crazed Le Roys. Madame divided her attention between this contest and the management of her crowded table, where men with their hats on, and women in wet water-proofs, — English, French, Italians, and Spaniards, — were bolting her unwholesome food, and washing it down with sour, watery cider. Fils ironically advised us if we were hungry to go to the "Ouest" for lunch (I wish we had), and he filled the intervals of his struggle with the travelling public with special revilings of ourselves as we sat at the unsavory meal. Lunch over, we gently asked for tickets to go now and return in the morning, and we would take our chance of coming later. Another storm of passion; there would be no chance! Sacre!! So we took our places, and soothed la mère's anger by the payment of the fare into her skinny old hand, — and were at peace. It was with grim satisfaction that we looked on as others were assailed with the same voluble French abuse, and finally dropped into the line of duly billeted penitents, until a wagon-load had accumulated.

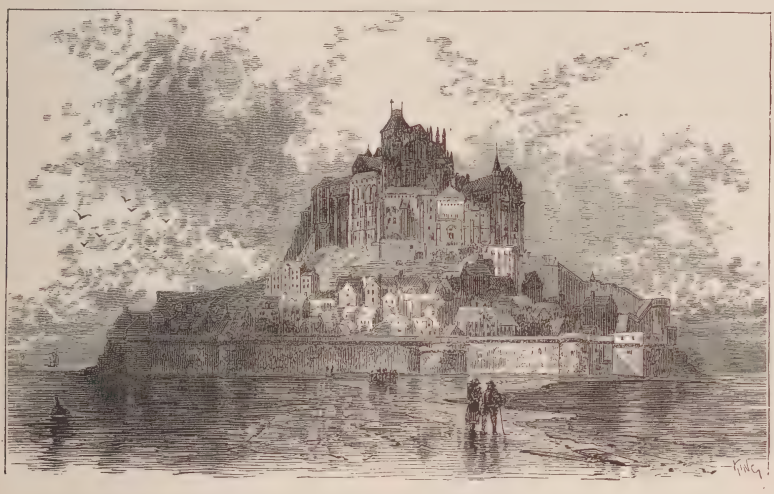
At last we were off, — over twenty persons in a long black-curtained wagon, with seats at the sides. Two of us had places with the driver; and what a driver he was! Those we had thus far seen became models of quiet by comparison. He was a jolly dog of a long, lank, seafaring Frenchman, all nerve and noise. His devices to startle his three thin horses were the work of genius. Yelling, hooting, whistling, whipping, whip-cracking, screaming, these are the ordinary weapons of provincial French Jehus, and he used them in their entirety; but he added evidences of much thought as to the possibilities of driving. "Pélagie" was his raw-boned, sorrel leader, and this was her fifth trip since morning over those seven miles of heavy sand. When the team grew callous to his demonstrations, he would lull them into a deceitful tranquillity by humming a low tune, then suddenly break out at the top of his hoarse

voice with, "Houp, Pé-la-zheee!! Crack, Crack, Thump, Pound, Kick, Hi! Hi! Pé-la-zheeee!" and off they would go for a fresh burst. When things were very bad I "spelled" him at the whip, and left him free to reinforce his calls by some fresh device with the reins. It was a favorite trick to stamp with both feet on the foot-board, as though the whole wagon were coming down about their ears. Now and then I drove, while he ran from one side to the other of the team seeking fresh spots for his lash. If we met another vehicle, he would call out in his broad Norman patois for its driver to lie in wait for Pélagie, and give her the sensation of a fresh thong. One smote so wisely and so well that Pélagie gave an unwonted plunge, and bang went a trace. "Ça ne fait rien, — je ne m'embarque jamais sans biscuit," said the hearty man, as he whipped a new trace-rope out of his box, and soon made ready for a fresh start. For every one we met he had a hoarse, but cheery salutation, and, at every auberge, he drew up for a friendly gossip, and a friendly glass, — which, as it rained hard, he called a "caoutchouc."

Such rain, such sands, such plunging of wheels into the mire, such revelation by fellow-travellers that they may be less gentle in their breeding than in their look, such tediousness and such discomfort, no one can know who does not follow seven hundred pilgrims, in a driving rain, from Pontorson to Mont St. Michel. The road was heavy and deeply rutted by dozens of huge carts loaded with the fruitful sea-washed silt of the Couesnon (called *tangue*), which is hauled for miles into the country for manure.

At last we neared the low dunes of the coast, beyond which the road drops down to the wide flat beach, and through the mist there loomed the silhouette of one of the coast guard of the Douane, slowly pacing up and down, wondering whether a smuggler will ever, ever come into the canal which conducts the Couesnon to the deep water beyond the bay. At the shore there was a conference with the bare-legged guide who precedes every vehicle over the mile and a half of treacherous sands, which shift at every tide and are often unsafe to pass, and which, in places, make a heavy road for heavy wagons like ours, — drawn by such tired and much-berated and long-suffering brutes.

Gradually, as we neared it, the marvellous fortress and abbey came slowly out of the misty distance, and towered above the plain, larger and far more majestic and beautiful than the distant view from Avranches had led us to expect.



MONT ST. MICHEL, FROM THE EAST.

Standing isolated in the sands at low water, and rising out of the sea when the high tides are in, its granite mass flanked with the houses of an ancient fishing-village and with a massive wall, and surmounted with the pondercus masonry and the graceful pinnacles of the "Abbaye-Château," Mont St. Michel holds its belfry over four hundred feet above the beach.

The west front is even more bold and impressive than the east, the rock being so steep that no fortification at the base was needed.

It is entirely unique, and not to be compared with any other sight the world has to show. One constantly wonders that there should be in this remote bend of La Manche an island so filled with historic and architectural interest, about which so little is generally known, — in spite of Victor Hugo's description: —

"Behind him, an enormous triangle, with a cathedral for tiara and a fortress for a breastplate, with its two great towers to the east, one round,

the other square, helping to support the weight of the church and village, rose Mont St. Michel, which is to the ocean what the Pyramid of Cheops is to the desert."

At the end of our drive, the sun set and the rain stopped, as we came under the massive south wall, entered the first of the triple gates, and alighted in the narrow and dingy vestibule of the town. A little beyond we walked through the second gate, which is flanked by "les Michelettes," the great Flemish-made, hooped iron guns (fifteen and nineteen inch calibre), still loaded with the stones Lord Scales's men charged them with before Columbus was born, — and when, of all Normandy, only Mont St. Michel continued to fly the French flag.

Most of the victims of the widow Le Roy's volatile son were dropped at the Lion d'Or, — but we feared a "correspondence" with the concern at Pontorson, and went on, through the third gate, to the Hotel St. Michel, where we entered a long, narrow kitchen, — a broad fireplace at the left, the glass door of the narrow dining-room at the right, and the staircase at the far end, which was cut into the rock.

It seemed especially odd to find a really comfortable modernly furnished room in such a queer old town and such a queer old house. For the moment, we only wanted to secure some provision for the night, and we went immediately out to make what use we might of the waning twilight.

The town, clinging to the steep hillside, and surnamed "pendula villa," consists of a single narrow street winding up the rapid rise from the outer gate at the southwest shore to the entrance of the monastery on the northeast slope, — most of it too steep for vehicles, and the latter part broken by frequent steps. Narrow alley-stairways between the houses lead to other houses perched on the crags above; and steps up or down, to the right, lead to the ramparts, with their fine, projecting, terrace-like towers. Seen at this hour, the frowning walls of the convent seemed a chiselled cliff against the sky. We returned by the walk on the outer wall to a stairway near the hotel. From a house whose top story overlooked our path, there came a well-trained, mumbling wail: "Par-pitié-et-pour-l'amour-de-Dieu-bon-étranger-donnez-quelque-sous-à-une-pauvre-

malheureuse-ah-ah,-merci-que-la-Sainte-Vierge-vous-bénisse." A neat placard begged for charity for a poor woman whose recollection of the use of her limbs dated back some thirty years.

She lay on a clean and comfortable bed in front of the open door, enjoying a beautiful view of the Normandy hills. She held us her tin cup with the air of one whom long custom had given absolute command over the charity of her passing public. No doubt she has all that a person of luxurious tastes in her station of life could ask, and we could only trust that there remained to her a paralyzed daughter to inherit the good-will of the establishment, which must be the most profitable on the island.

As we came again into the little street, it was filled with the busy sights and sounds of early lamplight. The seven hundred had gone, and there was much clearing away of the débris of their entertainment; the two hotelfuls had come, and there was much preparation for theirs. There was activity on every side, and the clatter of the universal sabot played a running refrain to it all. Our kitchen was taxed to its utmost, and our pretty little landlady looked weary and content. She had already fed eighty-five voyageurs since morning, the "table d'hôte" was now going on, and our own later repast was being prepared at the fire. From our window we saw a nimble lass in a niche of the rock opposite, washing dishes by the light of a hanging lamp. It suggested a shrine with its virgin awakened to useful work, and shedding melon-rinds and fish-scraps into the narrow street, where scavenging ducks quacked and gobbled. Long after we went to bed we heard the servants and the stable-men at table underneath us, and our coffee was ready at six in the morning. When do these people sleep? "O, in winter; all Mont St. Michel can sleep then. Voyageurs (and pilgrims) come only in the summer-time."

The history of Mont St. Michel reaches back to the eighth century, when, in obedience to the indications of the Archangel Michael, St. Aubert, Bishop of Avranches, founded here a Benedictine monastery. It grew in importance and richness during the succeeding four hundred

years, accumulating valuable manuscripts, and its monks becoming noted chroniclers and students of medicine. In 1154 Robert de Thorigny (surnamed Robert du Mont) became its abbot, and for more than thirty years he devoted himself to its aggrandizement. He increased the number of monks to sixty. With an equal genius for learning and for architecture, he earned for his island the name of "the city of books," and he built much of the finest part of the monastery. Honors were showered upon him from all sides, and so agreeable was he personally, that when the Archbishop of Rouen called on him with the Bishops of Bayeux, Coutances, and Avranches, they passed four days with him, "sans pouvoir le quitter tant sa conversation estoit sainte et agréable." Kings were his visitors, and he was the godfather of a child of Henry II. and Queen Eleanor.

During the next century Guy de Thouars sacked and burned the town, and put the whole population to the sword. He could not gain entrance to the fortress, but the flames reached it, and they did great damage. In the reconstruction the Abbot Raoul de Villedieu built the beautiful cloisters called "The Palace of the Angels," which, perched three hundred feet above the sands, remain to this day among the most exquisite in Europe, — "une fantasie moresque, éclose au milieu des granits sévères."

There are over two hundred columns, — those against the wall more simple in form, and those of the double row surrounding the court, light, graceful, and with a rich frieze carved after designs in the illuminated missals of the convent.

The buildings have been many times on fire, usually the work of the lightning which they so well invite. In 1427 Lord Scales attacked the fortifications with twenty thousand English. It was defended by one hundred and twenty noblemen, and the enemy were repulsed with the loss of two thousand men, and the two enormous cannon, "les Michelettes," which now stand at the entrance of the village. About the time of the discovery of America the beautiful church-tower was destroyed by a stroke of lightning, which caused the ninth conflagration in the monastery. At this time, too, the great cistern was built which is shown as one of the marvels of the place.

The Abbaye-Château continued under the government of the Church until the outbreak of the French Revolution. The last of the forty-six abbots was De Montmorency, appointed in 1788.

The Revolution suppressed the monastery, and changed the name of the island to "Mont Libre." It was then made a prison for the non-juring priests of Normandy and Brittany, who were afterward liberated by the Vendéeans when they went to lay siege to Granville. From this time, until very recently, it remained a state prison; but it is now returned to its ecclesiastical uses, and is a favorite object of pilgrimage.

We rose at the first peep of day, for the convent is open to the public at six in the morning; took our coffee, and (a useless precaution) a guide, who led us by the only route to the "Deux Tours du Donjon," under which is the entrance to the fortress, and where he could only hand us over to the regular practitioners of the establishment. We bought our tickets, at a franc a head, and bought a few holy gimcracks from the seductive monk who presided at the well-filled stand. Then we started out on a round of such sight-seeing as had nowhere else been offered us. Even in an Italian town, Mont St. Michel would be a huge lion, — here, in an obscure corner of France, and approached only by side routes, it is more marvellous than words can express; and its entrance, popularly called "Le Gouffre," is a worthy introduction to its wonders.

LE GOUFFRE, MONT ST. MICHEL.

From the vestibule (the old guard-room of the fortress) we passed through a hall to "La Merveille," — so named by Vauban, — the grandest combination of size, solidity, and art, in the whole structure. Its first story,

cut out of the solid rock, is a fine crypt, over two hundred feet long, called "Les Montgommeries," — from Constable Montgomery, the great Huguenot chief. He besieged the place, and finally succeeded, with the aid of a captured soldier of the garrison, whom he trusted too well, in having ninety-eight of his men hauled up the inclined plane, one by one, to be put to the sword when they reached the crypt. By this time he began to suspect something, and sent up his page, who discovered the treason all too late.

Next above this is the refectory, and the "Salle des Chevaliers," devoted to the Knights of St. Michel, which is not only the finest part of the Abbaye, but is said to be the largest and the finest Gothic chamber in the world. Three rows of pillars divide it into four aisles. The capitals are carved with different designs, and the whole effect is one of consummate strength and elegance. Two huge fireplaces, of more recent date, seem large enough for comfortable cottages.

The adjoining refectory is hardly less admirable, in spite of its serious mutilations by the prisoners, and of its thick coats of whitewash.

Over the refectory is the dormitory, formerly beautiful, but now the most mutilated part of the work. Next, over the Salle des Chevaliers, are the exquisite cloisters. One of the angles of "La Merveille" carries a superb pointed staircase tower, — "La Tour des Corbins," — which is seen near the right of the buildings in the east view of Mont St. Michel.

One of the oldest parts of the works is the Crypt de l'Aquilon, built in the twelfth century by Robert du Mont. It is remarkable for its Roman ogives, vaults without mouldings, and voluted capitals, and it carries us back to the period when Christian architecture first began to develop.

If the Salle des Chevaliers is the richest fruit of the labors of the old occupants of Mont St. Michel, the Basilica, especially in its exterior, is their fairest flower. Its former appropriate spire was destroyed by lightning, and the present bell-tower is entirely out of harmony; but in spite of this, the visitor will readily agree with Le Héricher, who says: "It has neither the unity of the Cathedral of Coutances, nor the statuary richness of that of Chartres, nor the grandeur of that of Cologne, nor the

fine carving of that of St. Ouen at Rouen. It has, so to speak, no portal, no towers, and now no spires; it has only small lateral naves. Nevertheless, with its centre placed on the point of a mountain, and its two extremities on superposed constructions, *insanæ substructiones*, its flanks, resting against other edifices, like a ship in her stocks, a pyramid of architecture on a pyramid of mountain, held aloft in mid-air, isolated above a desert of sand, or a plain of water, it impresses us more than any other with a sentiment of poetry and religion. 'The picturesque aspect of this edifice,' says Cotman, 'would render it worthy of a long pilgrimage, if religion, history, poetry, painting, had not all united to give celebrity to Mont St. Michel.'"

The exterior of the apsis is in fine granite, carved with extreme purity, and is exquisitely delicate. The stairway from this to the roof is called "L'Escalier de Dentelle," and really lace-like it is. The inside of this church is fine, but not especially interesting. As we passed through it, mass was being said, and there was a little throng of fishing-men and women, and an occasional "pélerin," at their devotions.

If this were a guide-book, it would be pardonable to tell of our further ramble through the Vestibule of the Vaults, with its "Cachot du Diable," the Crypt of the Chapter-house, the dark underground promenade of the monks, the Crypt of the Great Pillars (with nineteen pillars, seventeen feet in circumference and twenty-five feet high), which supports the apsis of the church, and is surrounded by five sombre chapels, which were lighted only by the perpetual lamps before their shrines, and one of which is the Chapel of "Nôtre Dame sous Terre," — who is, appropriately, a black virgin; the dungeons; the passage to the charnel-house; the funeral stairs; the great wheel-like (dog-churn-like) tread-mill, where sinful monks at once expiated their venial crimes, and hoisted the provision-car up the incline; the Chapel of Nôtre Dame of the Thirty Candles, — and all the other wonders of this really wonderful place; but our trip was shortened by the exactions of Fils Le Roy, and our tale must be shortened by the exactions of space. In this slight sketch I have only hoped to hint to the reader a small part of the lasting interest that our hurried visit awakened.

We trudged down the steep path, paid our modest bill, and regained our seats with the long mariner, whose "Houp-la! Crack, Crack, Sacre! Pé-la-zheeee!!" got us over the sands just ahead of the incoming tide, and took us back to Veuve Le Roy and her hard cider and harder breakfast.

At half past ten, after a dispute with another agent of the overtaxed and ill-appointed diligence line, we set out in a cramped "voiture particulière" for Dol and the rail. Our sympathies are not with those who mourn the departing days of diligence travel, — a little of it is pleasant, but more than a little is too much. The country was a shade less interesting — possibly because a shade less novel — than that between Villedieu and Avranches; but it was filled with the same quaint air, the same black-roofed and gray-fronted villages, and the same thatched country cabins, gay with their many-colored vegetation. We were now in Brittany, — in the land settled in 523 by the savage tribes driven from Great Britain at the time of the Saxon conquest, and in which are still seen monuments of their early occupation.

The people of the whole region of Normandy and Brittany have been slow to give up the customs and traditions of their ancestors; but the march of the railway and the factory is fast driving them to the wall. The traveller gets more comfort and more honest treatment at the hands of the railway officials than is to be hoped for from their rascally predecessors of the diligence lines; but, — and here again our sympathies *are* with those who mourn the change, — though one travels farther and faster, one gets less of the local coloring of provincial life, and absorbs less of its true spirit.

It is only on fête days that the peculiar costumes of Normandy and Brittany are seen in their glory. Ordinarily we had to content ourselves with the short petticoats, sabots, and work-a-day caps of the country-women; but on one grand occasion, in Brtitany, we saw a trace of the white muslin magnificence which used to prevail. At such times, the women come out in an effulgence of starched head-gear, each village having its own peculiar style, which is worn with patriotic pride.

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HEAD-DRESSES OF THREE NORMAN TOWNS.

It is, after all, the marvellous rather than the picturesque that one misses in daily travel in this land. Nothing could be more coquettish than the tasselled "white cotton nightcap" of the country-girls of Normandy, celebrated by Miss Thackeray. Among the more curious of the common dresses one still sees are those of Cancale, Oëssant, and Châteaulin.

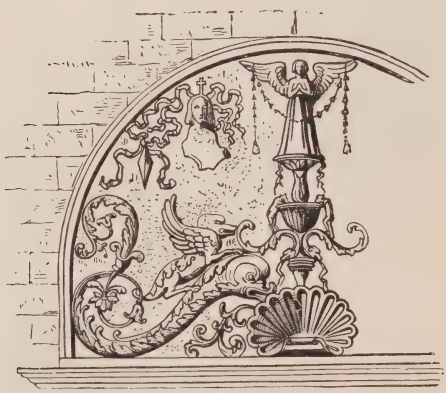
PEASANT-GIRL OF CANCALE.

Dol is a very old town (King Nominoë was crowned here in 843), and it has over four thousand inhabitants, — *et voilà tout.* It is dreary to the last degree. Its cathedral — which reads very well in the guide-books — is heavy and mournful, seen after Rouen, though it has an exquisite tomb of 1507; its streets are curious, it is true, but the gray stone and

PEASANT-WOMAN OF CHÂTEAULIN.

PEASANT-GIRL OF OËSSANT.

the black slate hang like a pall over the fancy of the traveller who has known the charm of fluted red tiling. Dol can never be otherwise than sad; and under a leaden sky, as we saw it, with the cold rain dripping from its eaves, it was infinitely dismal.

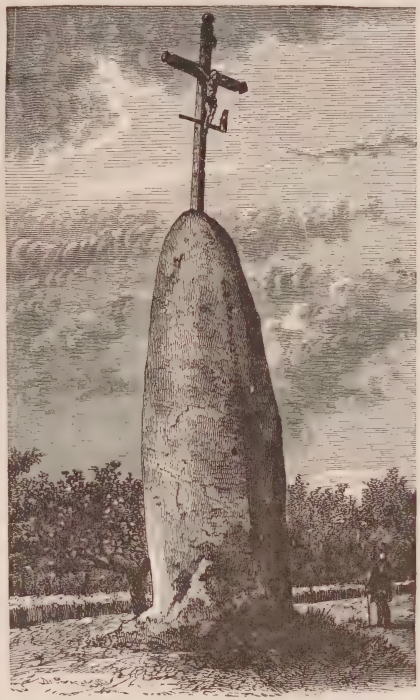


ARABESQUE OVER TOMB, — CATHEDRAL AT DOL.

Like the Channel Islands, Brittany has many Druidical or Celtic remains. In a cornfield near Dol stands a Menhir* thirty feet above the ground, and said to be half as long below it, on the top of which the early teachers of Christianity shrewdly planted a crucifix.

* From the Breton *moen*, stone, and *hir*, long.

We were glad when our last snarl with the agent of the Avranches diligence (about an overcharge on baggage) had been fought out and we took our seats in the train for St. Malo, where we arrived toward the middle of the afternoon, in a breaking sky, which let now and then a ray of sunshine into our tired and fretted souls. Here we found the long-forgotten comfort of a really good and modest French hotel, whose name, "Franklin," attracted our patriotic impulses, and whose white-capped peasant waiting-women brought the rural air into the sombre walls of gray St. Malo.



MENHIR NEAR DOL.

St. Malo is *triste*, too, but only as a background to the most bustling activity, for it is a busy seaport, and its beetling walls are bright with French uniforms, and, in the season, with pleasure-seekers from Paris, drawn here by well-appointed Bains de Mer. The road from the station overlooks the bathing-beach, well fitted with summery appliances, and leads to the Grande Porte, with its great, ponderous round towers, — one of the five gates of the heavily walled town. It is an old town, very old, and a part of its wall dates back to the thirteenth century, while it has well-preserved houses of the sixteenth, and a cathedral of the twelfth, — built on the foundations of one destroyed by Charlemagne in 811. In spite of this, it is not an old-looking town. There must be some influence in the air of this coast that is congenial to the preservation of masonry; there is an absence of the climbing vegetation and moss which in other places have so much to do with the marking of time on the faces of old buildings. Vauban's work at St. Malo might

apparently have been done under the last Empire. The "Tour de Solidor" at St. Servan, which adjoins St. Malo on the land side, — a turreted high castle of three round towers, built five hundred years ago, — bears in its texture absolutely no impress of age.

LA GRANDE PORTE, ST. MALO.

The walls of St. Malo enclose a population which has some of the characteristics of insular people. They do not call themselves French, nor Bretons, but "Malouins." They are descendants of a race who in time of war have played the rôle of vulture with much success. Their nest was well defended by art, and still better by nature. The Duke of Marlborough attacked it in vain; the English and Dutch fleets bombarded it day after day without doing much harm. When the occasion offered, the Malouins fitted out their own vessels, and either preyed upon the commerce of the enemy or did a stroke of business in his ports, — whichever promised to pay the best. In a single war they captured over fifteen hundred ships, some of them loaded with treasure. In this way St. Malo became the most opulent city of the kingdom.

In time of peace this thrifty people cultivated the taste which has placed them among the foremost cod-fishers of the world, and has caused them to break their bonds, and, during the century, to cover the pleasant hills of St. Servan with a population larger than their own, and equally engaged in the industry of the Newfoundland Banks.

The town has an interest for Americans as being the birthplace of Jacques Cartier, who discovered Canada. Here, too, Châteaubriand was born, — in a room of the present quaint and uncomfortable Hôtel de

France, — and on the little island of Grand Bey across the beach he lies buried.

St. Malo, as seen from the tomb on Grand Bey, has a fine and imposing look when the waves reach the feet of the black rocks on which it

ST. MALO, FROM GRAND BEY.

stands (like a flattened Mont St. Michel); when the tide is out, — and it goes out very far, — it looks like a stranded town among high-lying rocks.

A new watering-place town, Dinard, lies across the harbor, and thither we went on the afternoon of our arrival to visit friends from Newport who were passing the summer there; here also we found that a Philadelphia family has a fine summer residence on the eastern cliff.

Early the next morning we went down the interminable stairs that

led from the edge of the quay to the deck of a little steamer lying in the gulf of mud below. The tide was coming in, and by the time we passed the Tour de Solidor the mud and the sands were all covered, and the strong current helped us on our way up the beautiful Rance, — a river lined with more varied loveliness of hillside woods, fruit-laden orchards, old mills, old chaumières, old châteaux, and fertile fields, — all overhung with the charming air of Breton quaintness and oldness, — than we had thus far found. It was a charming sail, first up the broad bay of the embouchure, and then (through a lock) into the narrow canalized river, and, finally, at the end of two hours, into the deep gorge, at the crest of which stands the old ducal city of Dinan, with its superb modern viaduct a hundred and fifty feet above the river.

DINAN, FROM THE RANCE.

There is a new zigzag road up the hill by which the ascent is easy, but he who comes to see old Dinan should shun this and climb the steep and narrow cleft between the overhanging sixteenth-century houses of the "Rue de Jerzual," and through the Porte de Jerzual, which for so many hundred years defended this main entrance to the town.

It is a little-used street now, and the old tumble-down buildings have escaped the desecrating hand of restoration, which is playing such havoc with the mediæval side of European towns.

The frowning edges of the hill on which Dinan stands are still rich

with the ponderous remains of its old defensive wall, which is a wonder of ancient masonry, built "when men worked in stone for three sous a day"; and most of it is in the picturesque and ivy-grown condition of the "Porte St. Malo."

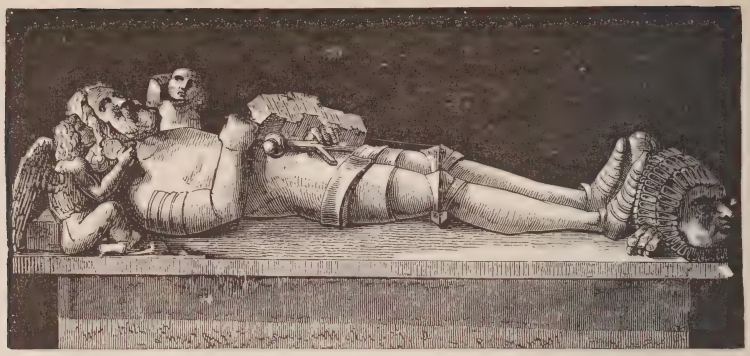
PORTE ST. MALO, DINAN.

Starting from the Hôtel de Bretagne we enter the beautiful walk on the ramparts (which nearly surround the town), with charming views of the lower-lying country on one hand, and of the massive round towers and walls on the other. The interior of the town is dingy and dull, though with much curious old architecture; but its *enceinte* is unsurpassed for beauty and interest of its sort.

About a mile up the Rance is the little village of Lehon, which is reached by a path from the Porte St. Louis, the last hundred yards of which is down a steep narrow cleft in the rock, where steps have been hewn out of the solid granite. The village is overlooked by a high conical hill topped with the ivy-clad ruins of the Château de Beaumanoir. This, as well as the Priory of Lehon, founded in 850, has long been given over to decay and a wilderness of vegetation.

In the Museum of Dinan there are a number of tumulary slabs taken from the Beaumanoir chapel attached to the Priory; among them one of Jean de Beaumanoir, who was murdered by his steward.

The day after our arrival was Sunday, and we hied to stout Josephine Santier, "Loueur d'ânes," and got a couple of odd little three-wheeled donkey-carts for a sweet-will wander into the country. And a jolly trip we made. We scorned the high-road, and the by-roads led us a merry stroll over almost impassable woodland paths. Now and then we could ride, but much of the time it took the combined efforts of the party to



TOMB OF JEAN DE BEAUMANOIR.

keep the vehicles right side up on the rough paths. When we were on good roads our small boy devoted his entire time and strength to cudgelling "Vigilante," who drew the foremost trap, into the semblance of a slow trot. Josephine had told us: "Il n'existe pas de bête plus jaloux q'un âne," and, true to her asinine nature, where Vigilante led Penelope followed closely; but by changing their order we found that they are no more jealous to follow than they are not to lead, and before we got home Mr. Pickwick, with his "great horrid horse," had been in no worse plight than were we with our more concentrated forms of stubbornness.

At one point of our journey we came across the ill-kept fields and through a superb disused avenue, upon the ruins of the Château de La Garaye, the home of Mrs. Norton's "Lady of La Garaye," hallowed by the deeds of charity of the Count of the name and his charming wife. Now all is overgrown and unhindered decay.

> "The walls, where hung the warriors' shining casques,
> Are green with moss and mould;
> The blind worm coils where queens have slept, nor asks
> For shelter from the cold."

The true-hearted people, whose charity has made this spot memorable, smothered a great grief in the activity of good deeds. The Count studied medicine and surgery in Paris, and the Lady became a skilful oculist. They then returned to their old home, banished worldly amusement, and threw open their doors to all suffering humanity.

THE CHÂTEAU OF LA GARAYE.

"Her home is made their home; her wealth their dole;
Her busy court-yard hears no more the roll
Of gilded vehicles or pawing steeds,
But feeble steps of those whose bitter needs
Are their sole passport. Through that gate-way press
All varying forms of sickness and distress,
And many a poor worn face that hath not smiled
For years, and many a feeble, crippled child,
Blesses the tall white portal where they stand,
And the dear Lady of the liberal hand."

From La Garaye we came out upon the high-road, and started in search of a country luncheon. We were told that a kilo farther on we should find a "jolie petite auberge," and we urged our unwilling brutes that much farther away from home, until we came upon a low stone hut with moss-grown thatch, over the door of which there hung the bush that was needed by the wine of such an establishment. Evidently the same thatch covers man and beast, and the approach to the single door was over an untidy mass of manure, which made it necessary to drive so close that the ladies could step directly into the house. At one end of the

room was a small fire on a large hearth, and near this, built up like the berths of a ship, and half closed by sliding doors of carved oak, were two narrow bunks, well filled with comfortable bedding. A cupboard of smaller beds at the other side of the chimney suggested children. In front of these a capital old carved chest served for the storage of clothing, for a seat, and as a help to climbing into bed. Two plain tables, with benches for seats, ran lengthwise of the room, which had a floor of beaten and well-swept earth. From the ceiling hung a basket for bread and a rack for spoons, — which are the only utensils for conveying food to the mouth that the house is expected to furnish, the older institution of fingers being still respected, to the exclusion of forks. The smoke-blackened beams of the ceiling were festooned with sausages, and hung with hams, bacon, bladders of lard, garlics, onions, harness, whips, horseshoes, and all else that the family possessed of a hangable character.

Grandmamma sat at the side of the fire, in a queer, wide-winged Breton cap of starched linen, with a relay of knitting-needles stuck under the front, — awaiting their turn at the fast-growing blue stocking which occupied her nimble fingers. Her daughter, the hostess, similarly attired and occupied, sat at the other side watching a Sunday game of cards that four men were playing at the table opposite ours, and gossiping with some freshly arrived customers.

Little direct attention was paid to us, but we were evidently being discussed in the undefinable patois of the country. One of our party expressing curiosity as to the contents of a covered box in front of the fire (which might have held a batch of bread set to rise), the landlady produced from it a swaddled week-old baby, which was duly cuddled and admired, then nursed, and put back in its nest.

There was no disposition to force us to buy anything, and we were treated rather as morning callers. Finally, in reply to our "What can we have?" "Cider" was suggested. "And bread and butter?" "But certainly," and there was produced a "pot" of cider (almost two quarts), with glasses; a huge half-loaf was laid on the bare table, and butter was brought on a plate. "Can we have knives?" — then a queer look at each other, and, "What! have n't you got your knives?" and the four

card-players, in the most courteous manner, took their big clasp knives from their pockets, wiped them carefully on their trousers, and offered them to us. The cider was thin and sour, but the bread and butter were good, and the place and people were tidy and cheery. We made a comfortable luncheon, after all. "How much is to pay?" "Four sous for the cider; we put no price on bread; it is the Bon Dieu who gives it." No hint could be more delicate, and the modest bit of silver we gave "for the baby" was taken with cheerful dignity, as they all rose to bid us good day, and saw our little wagons get safely over the mire and out on the hard roadway.

When we had arrived at Dinan, and given over our wearying asses, we heard rumors of "the procession," "the Bishop"; and hundreds of people, mostly peasant-women in holiday costume, were chatting gayly under the shade of the trees, and about the grand old ruin of the gateway at the other side of the little square.

We watched the picturesque crowd from our windows, and, finally, there came through the archway a long procession of priests and nuns, and acolytes, and maidens in white, and school-children, with four men bearing a gorgeous canopy, which was set on the ground when the procession halted. Here the priests fell to reading their breviaries with downcast eyes, — now and then cast up and shaded by the hand to peer toward the setting sun, in an expectation which lasted long, and finally became anxious and — so far as in them lay — annoyed. At last there was a slight murmur and bustle, and a carriage drove up from which descended three priests and one portly, empurpled bishop. The latter was beset by the attendants, clad in gorgeous raiment, and topped with a shining mitre. He passed under the canopy and followed at the rear of the troop.

Stepping to a corner of his cage he laid his fingers, in benison, on the forehead of an infant. At once the throng brought forth dozens of children in arms; it fairly bristled with babies who were brought, one after another, to be blessed with the sign of the cross, to be touched by the hallowed finger of the Father of the Diocese. It was a charming sight, but the delay it caused did not charm the long-waiting priests, who had

to halt again and again, with the risk of only a dull twilight for the anticipated ceremonial at the church. The last we saw of them, the last of the babies was being blessed in the slanting sunlight under the green-vined archway, and the procession passed from our view.

Our return to St. Malo was in an open carriage over the well-kept road, and through the beautiful country by way of Dinard. Leaving the rest of the party to find what interest they might in St. Malo, I set out alone on an agricultural trip to Rennes, seeking the mysteries of the making of "Camambert" cheese and "Prévalaye" butter.

Camambert is perhaps the mildest and most delicate of the many fine cheeses of France, its strength, however, escaping the palate only to attack the nose. It is, indeed, a curiosity of strong odor; and a package of the little disks, though wrapped in oiled silk and taken in a trunk to Jersey, gave to all its contents a suggestion of *mus decumanus defunctus*, which quite reconciled me to the refusal of M. Lehagre, its maker, to allow me to see his processes; and to make me content with his assurance that, with a good market for my butter, I could not afford to use the cream needed for its manufacture.

Neither was my day well selected for Prévalaye. There was no butter-making going on, and my agricultural trip would have been a failure but for the "Ferme-école des Trois Croix," within a short drive of the city. This institution is the property of Mr. E. Bodin, who is a large manufacturer of improved agricultural implements, which are beginning to make their way among the better farmers of Western France. His shops are extensive, and his implements seemed in general very good, though not equal to those of England and America.

The school, which is a government institution, was interesting, and, allowing for the difference of customs, may have some good suggestions for our own feeble though costly establishments of similar character. Twelve apprentices, who must be at least seventeen years old, are received each year; the course is for two years; the object is to train competent farmers, farm-superintendents, gardeners, and nurserymen; the apprentices work like farm laborers for the benefit of the proprietor (who is also the Director of the School). In addition to the Director there are a gardener

and nurseryman, an instructor in mathematics and farm book-keeping, a teacher of practical agriculture, and a veterinarian; the pupils (or apprentices) are under constant supervision, and are allowed to leave the farm only for a certain time on Sunday; the hours are from four in the morning to nine at night in summer, and from five to nine in winter. The time is almost entirely occupied by work and study; the regimen is very simple, but nourishing and sufficient.

The candidates for admission are nominated by the Prefect of the Department, after an examination prescribed by law. The examination is made by a committee consisting of the Director of the farm and four members nominated by the Prefect and appointed by the Minister of Agriculture. The demand for admission must be accompanied by the certificate of birth and of vaccination, and by an engagement to "conduct myself honorably, to obey the rules, and to work with all my power in order to profit by the favor that you will have the goodness to grant me." At the end of the course the graduates are examined by the committee. The best receive from the state three hundred francs and a certificate. Those who are not found worthy of a certificate receive, nevertheless, two hundred francs. In case of special excellence, the committee is authorized to award silver and bronze medals in addition.

Some of the results of the arrangement are, that Mr. Bodin gets the services of twenty-four capital young men for the work of his farm; that twelve first-rate young farmers and gardeners are sent out every year with a good practical education, with a thorough training in their art, and with a little money for their start in life; and that a knowledge of improved practical farming is disseminated throughout the department by practical working men, well trained for the successful prosecution of their business.

The young man who showed me over the well-kept farm, and through the well-filled stables (and who was the first Frenchman of his class whom I ever found to decline a fee), gave ample evidence of the good degree to which a peasant-boy may be developed by such influences as those of Les Trois Croix.

I make no criticism of our "Agricultural College" system as a means

for effecting the better education for professional life of farmer's sons who hope to escape the drudgery of their father's occupations; but as a means of qualifying them for the skilful carrying on of the art these colleges pretend to foster, I believe that one school like that at Les Trois Croix, where a more purely practical education is given, and where poor boys are trained to hard work under the direction of sensible, practical men, would be worth them all.

I saw, here and elsewhere, less than I had expected to find of the little Brittany cows. They are a capital race for butter-making; but the passion of the times seems to be for large animals, and these cows are fast being "improved" out of existence by crossing with beefy shorthorns from England.

Generally speaking, the agriculture of Brittany is in a very backward condition. The peasantry of some of the departments cling to their old Armorican traditions, speak only their ancestral Celtic, and live in an exceedingly meagre way. The influence of the annual agricultural exhibitions, and of the six Ferme-écoles, together with a national school of agriculture under excellent management on a farm of twelve hundred acres at Grand-Jouan, and (near Quimperlé) a school of practical irrigation and drainage, is being felt, and the general awakening of the human mind is at last manifesting itself in the darker regions of the old peninsula. The communes are now tolerably supplied with primary schools, and many of the younger men among the peasantry are improving their systems of work.

At the same time there is no sympathy between the proprietors and their tenants, and country-life in the region has so few attractions, that absenteeism is the rule with those who can afford to live in Paris and the larger towns, — where they use their money in other enterprises and leave their estates to the grinding management of agents.

On the other hand, the recruits taken into the French army from Western Brittany have acquired a taste for better living, and a knowledge of better pay, and they have deserted their native land whenever opportunity has offered; for the hard life and the meagre living of Brittany

are not attractive to one who has known the easier and better-fed condition of the army. To such an extent have these influences affected the population, that wages have more than doubled within a few years.

The average family of the Breton peasant consists of man and wife, three children, and two aged persons. Of these, only the man and wife are able to earn more than their own subsistence, and two of the others earn nothing. Their income (in whatever rural position) is small, and it is impossible to accumulate savings. They have a hard and hopeless life, and of course they look forward with delight to any means of escape.

In the farm-house the whole family rise in summer at four o'clock. The women go to milk the cows and attend to the calves and pigs, and the men to feed and harness their teams. At half past four they breakfast, — always on soup, often on milk-soup. From five to ten the men and teams are at work. At ten they dine, — on milk and buckwheat porridge, or buckwheat pancakes. In winter the milk often fails, and the porridge is then made with fermented oats. It is very nutritious, and much esteemed in Finistèrre and Morbihan. In the other departments they usually dine on buckwheat cakes. After the first of May they sleep from dinner-time until noon, when work begins again. At three they lunch, — on bread or fried cakes, with milk or butter. From seven to eight is the supper, the principal meal of the day. It consists of soup and bacon, except on "jours maigres," when the bacon is replaced by fish or potatoes. At the supper they drink cider when they have it; but they rarely have it in winter; there is often only enough for the harvest-work. As wages advance, the use of meat is increasing.

This is the regimen of the farmer's family, and of his regular laborers. Those who live in their own houses, while boarding themselves, live much more poorly, using neither meat, cider (except on Sunday at the auberge), nor butter, and they are much more feeble and indolent. They were paid a few years ago from $32 to $38 a year with board while at work; but they are idle about one third of the time, and then they must support themselves. Of course the women and the children of a useful age (which is an early age in France) must also work to the utmost of their capacity.

Such seems to be the common farm life of this benighted and picturesque land. Of course there are many instances of better work and better living, and these are happily increasing from year to year, and their influence is benefiting the agriculture of the country generally; but, as a rule, poverty and hardship prevail throughout the whole province.

When I returned to St. Malo the wind was blowing great guns, and in the office of the steamer company was posted the following telegram: —

"JERSEY, Sept. 15.

"Forte tempête! Le 'Wonder' partira demain à dix heures.

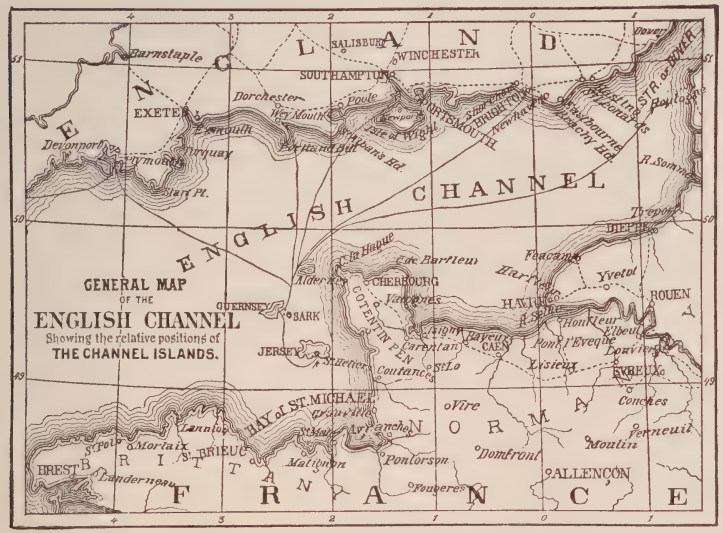
"LE COUTEUR, Capitaine."

So we were storm-bound in St. Malo, and rained in and bored as one can only be in a gloomy, dripping, foreign walled town.

CHAPTER V.

OLD JERSEY.

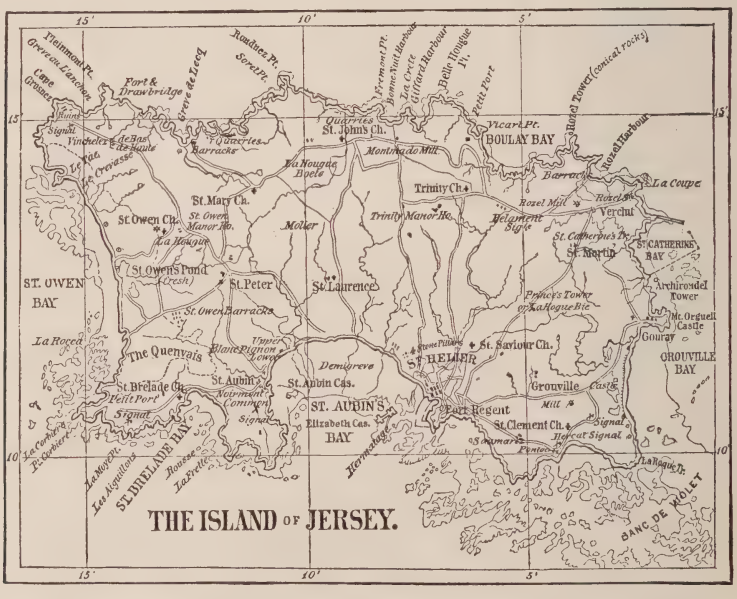
NOTHING in the whole experience of travel produces such genuine emotion as discovery. To come upon an interesting and important old town, of which we had hitherto known next to nothing, and of which we are sure that most of our countrymen are equally ignorant, awakens an introverted enthusiasm that proves us akin to Columbus. "Where is



Trèves, exactly? I don't think I quite know." Such a question as this, from one who is otherwise our equal, always emphasizes the secret satisfaction with which we contemplate our individual merit of good fortune.

Discovery is not the least of the great pleasures that finally reward those who climb down from the high quay at St. Malo and embark on

the side-wheeler "Pinta," bound for the untried waters of La Manche, which we found still so lashed by the tail of the "forte tempête," that even the barbarous passage from Dover to Calais faded from our recollection. After four hours of almost mortal agony, we ran past the great mole at St. Helier's, and were in still water. In due time we were in the old "Hôtel de la Pomme d'Or," and were at rest, amid such wholesome old-fashioned hospitality and cordial attention as only a combination of French and English customs can give. Think of Southdown mutton and "Suprême de Volaille," of English tea and French coffee, under the same roof!



The rain, which had so much interfered with our pleasure in France, had rained itself out, and our two weeks in Jersey were blessed with the most superb autumn weather. We were in a land rarely visited by Americans, and so little known to our literature of travel, that at each turn of its beautiful lanes we found a fresh surprise and delight. So much as is generally known of the island relates — just as our popular notions of Siam centre around its twins — to the cattle for which it has long been famous. The cattle are still there in all their beauty, but they are only an element of a beauty that is almost universal.

Our own interest in Jersey was largely an agricultural one, but we found much else that cannot fail to engage the attention of all who care for the picturesqueness of history, of society, and of nature. The island lies sixteen miles west of the coast of Normandy, forty miles north of Brittany, and about one hundred miles south of England. It is about as large as our own Staten Island, containing nearly forty thousand acres of land, about twenty-five thousand of which are under cultivation. The population is over fifty-six thousand, or about two and one fourth for each acre of cultivated land. More than one half of the population is in St. Hélier's, which is the only town of considerable size.

More even than most islands, Jersey is a little world by itself, with its own history and local peculiarities, very different from any that we find in other countries. Its agriculture is as unlike that of England or France as are the people themselves unlike their French cousins or their English compatriots.

If one feature of the scenery is more peculiar to the island than any other (and almost more charming than anything of its kind elsewhere), it is the embowered lanes which intersect it in every direction, like a network of lovers' walks. They are always of about the same character, yet always varying; a narrow, capitally made road — as hard and smooth as those of Central Park — often only wide enough for a single vehicle, but with frequent bays for passing; high earthen banks at the sides for fences, which make the lane seem a trench cut into the soil; trees growing from the tops of these banks, sending their snake-like roots down under the grass and clustering ferns, to the firm ground beneath, and overarching the way with their branches; and, to crown all, the greenest and most luxuriant ivy, starting at the roadside gutters, and, claiming its share of the bank, winding itself closely around the trunks of the trees, and draping their interlocked branches overhead, or infolding the end of a dead limb with a mass of sturdy blossom or fruit. New trees are springing up to replace those which the ivy has reduced to mere stumps or trunks of solid verdure, and so the form and combination of the row is varied at every step. Frequent gate-ways open glimpses into the fields. Here and there a bit of stone-work replaces or supports the

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earthen wall. There are many cool-looking, stone-arched, natural fountains sunk in the verdure, and sometimes the land slopes away from the road into an overgrown ravine, from which there comes the sound of running water.

LANE AT ROZEL, OLD JERSEY.

The winding lane at Rozel, which runs at the crest of a damp and sheltered ravine, in whose deep shade a rivulet runs, and the old manor road at Vinchelez (with an ancient Norman gate-way), are good examples of Jersey lanes; but there are miles and miles of these in every direction, all of the same general character, and constantly changing in detail.

It is through such secluded ways as these, and past comfortable farm-houses, and thatched cottages and sheds, that one drives to get an impression of the agriculture and the life of Jersey. It soon becomes evident, however, that no traveller's casual impression will do justice to this compact little country. It is too different from what we find elsewhere, and needs study to be understood.

LANE AT VINCHELEZ, WITH NORMAN ARCH.

Wishing to get the full impression of *living* in Jersey, we made but a

short stay at the "Pomme d'Or," for the blessed English institution of "lodgings" prevails, — an institution whose adoption in America would add much to the comfort of the nomadic part of our population. Driving about in the neighborhood of the town, we decided on a cottage on the shore of St. Aubin's Bay (about a mile from St. Helier's), kept by a widow

ELIZABETH CASTLE, FROM OUR WINDOWS.

and her daughter, who, with the help of a small handmaiden, did all the work of the establishment. We had a pleasant parlor and dining-room *en suite*, three chambers and sufficient closets. For this, with service, fires, gas, and all extras, the charge was three guineas per week (about seventeen dollars currency). We did our own marketing in person, and had passbooks with the butcher, grocer, and baker, and were soon as much at home, and in as regular relations with our base of supply in the town, as though we had no other home in the world. In the house, the hours, the customs, and the diet were quite under our control, and we were fast growing into Jerseymen, which seemed a very pleasant thing to do. Our rooms occupied the whole sea-front of the house, and commanded a superb view (toward the afternoon sun and the crescent moon) over the bay and past Noirmont Point. The view to the left was bounded by the town and harbor, and before us stood the storied pile of Elizabeth Castle, like Mont St. Michel, an island at high tide, and accessible over the dry sands at low water. Our sunset view, when the sands were bare, is that shown in the cut of the castle.

Looking to the right, toward Noirmont Point, the view lies across St. Aubin's Bay, with the cluster of rocks on which St. Aubin's castle stands.

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Even Jersey has not been exempt from the invasion of the railroad, and every half-hour there rattled along the shore in front of us the odd little train that runs from St. Helier's to St. Aubin's, four miles. It was drawn by a little pony of a locomotive, and consisted of two cars, like

ST. BRELADE'S BAY.

those of England, but with a covered and well-railed balcony running along each side, and usually occupied by the passengers, who at this season generally avoided the closer compartments within. This arrangement gives an unusual width to the cars, but there seems to be no objection to it for roads where there are no cuttings; it is, certainly, most agreeable in pleasant weather, and admits of the opening of windows during rain.

Being much favored in the matter of weather, we passed a good part of every day in driving about the country; sometimes lingering over the majestic rocks of the north coast, which rises about three hundred feet above the sea, and is especially abrupt and grand; but more often haunting the quieter lanes and drinking our fill of a sensation not to be repeated in our different rural surroundings at home. Jersey is pre-eminently a country for idling. It is large enough for varied excursions, but small enough for any point to be reached easily, and it has an ever-varying and never-ending charm of coast and interior, of which one does not tire.

An impression of the island, gained only from the extreme western and

northern coasts, would be an impression of a high, rocky, and almost treeless land, with little to invite the visitor, save the noble bluffs and rocks; but almost immediately on leaving the coast one drops into the characteristic rural scenes which greet him at every turn until he reaches the low-lying shores of Grouville and St. Clements. Little dells near the north side of the island, their rivulets combining to form the growing brooks, unite in deeper and broadening valleys which spread into the plains at the south, — plains into which the hills project here and there, giving admirable variety to even these lower lands, and affording the most charming sites for country-houses that overlook the St. Clements coast, fringed at low tide with far-reaching, mellow-colored rocks. Among these the spring tides rise to the height of forty feet, leaving them bare for miles as they recede.

CAVERN AT GRÈVE AU LANÇON.

A good object in driving is to see the old parish churches; going from one to the other, with the aid of a map, through the cross-lanes, which are much more picturesque than the main highways, and which often drop down into charming valleys, past old-time mills, and among old thatched farm-houses.

The churches themselves are interesting from without, but the interiors that we saw are dull and cold and colorless. They all stand in ancient churchyards thickly set with tombstones, whose inscriptions are in

French, and many of which are very old. These churches are all ancient, and there has never been an elaborate restoration of any of them. They seem to have been merely kept in suitable condition for use, and the necessary additions have generally been made in the style of the original structure.

The most recent of these edifices is that of St. Helier's, which was consecrated in 1341. Eight of the twelve were consecrated in the twelfth century, — the oldest, St. Brelade's, in 1111. This was the earliest Christian church in the Channel Islands, and is much the most antiquated and picturesque of all. St. Saviour's Church, with a square tower and fine ivy, which stands just beyond the edge of the town, and St. Martin's, four miles out, with the more usual angular spire, are perhaps the finest examples of the type.

ST. MARTIN'S CHURCH, OLD JERSEY.

These churches, in nearly every instance, consist of two or three similar stone buildings standing side by side (probably built one after another as needed by the growing population). The separating wall is opened with archways, so

ST. BRELADE'S CHURCH.

as to bring the congregation all within range of the minister's voice, — though the heavy pillars still cut off very many from the controlling reach of his eye.

I found attendance at two of the country churches at which I stopped on Sunday-morning rides anything but inspiriting. Aside from the novelty of the use of the French language in the familiar Episcopal service, there was little to relieve that heavy air of blank *ennui* which so dulls us in the whitewashed interiors of many of our old parish churches at home.

From their quaint exteriors, their conspicuous age, the æsthetical capacities of the church ritual, the fair assumption that French congregations would put more form and art into their religious exercises than New England congregations do, and from the rustic simplicity of the people (no less than from their charming rural surroundings), one would naturally expect an ideal service, — simple, tender, and full of dim religious emotion. Indeed, as I recall the conditions under which these exercises are held, I can only think that my selections were unfortunate, and that in those churches which I did not visit (in spite of their glaring white walls) I might have had a better experience; and that the interest which is necessarily awakened by these gray, mossy, and ivy-grown sanctuaries need not always be checked on passing their low portals.

The Channel Islands boast of being the oldest possessions of the present ruling house of Great Britain. Normandy, to which it then belonged, was given by Charles the Simple to Duke Rollo in 912, and it passed to the English crown with William the Conqueror. When Normandy was regained by France the islands remained with England, and, although Jersey has been frequently attacked and sometimes invaded by the French, they have never had possession of more than a portion of the island, and never succeeded in conquering the loyal spirit of its people, though they committed wide devastation. So much was Norman or French invasion feared, that there were inserted in the litany the words, "And from the fury of the Normans, good Lord, deliver us!"

When King John lost Normandy, he looked upon these islands "as the last Plank left of so great a Shipwrack," and resolved to keep them at

whatever cost. He was twice in Jersey in person, and became a sort of vicarious father of the country, to which he gave "many excellent Laws and Priviledges."

During the reign of Edward III., the famous Du Guesclin, with an army that included the flower of French chivalry, effected a landing, held possession of the eastern parishes, and besieged for some months Mont Orgueil Castle, to which the chief persons of the island had retired. The castle held out, and the invaders withdrew into France.

MONT ORGUEIL CASTLE.

Henry VI., during his contest for the throne, solicited French aid against Edward IV., and his Queen contracted with the Count de Maulevrier that, in consideration for his services, the Channel Islands should be made over to him. He seized Mont Orgueil Castle by surprise, and employed every device of kindness to induce the people of Jersey to renounce their allegiance to England and to acknowledge him. "He could never prevail on the inclinations of a people who were enraged to see themselves sold to the French, a nation which they hated; insomuch that, in about six years' time, he could never make himself master of above half the island." During this period there were frequent skirmishes between the French and the troops of the loyal Seigneur of St. Ouen, who held the western parishes.

Finally, under Edward IV., the castle was reduced by famine, and the French were driven quite out of the island.

Mont Orgueil, which dates back to the time of Cæsar, figures largely in the early history of Jersey, and its story is full of interest. It is now a noble mass of ruin, and the ivy which frames its abandoned loopholes piles massy green upon its crumbling parapet, and drapes its ponderous sides with living verdure; the ivy and the salt sea-winds have claimed it for their own; it is only a dreamy old crag of solid walls, whispering its tale of the bygone times in the idle and gladly credulous ear of the traveller. At its feet breaks the summer spray of La Manche, and from

GATE-WAY TO MONT ORGUEIL CASTLE.

its crest one sees, across the smoky distance, the phantom spires of Coutances. There is a snug inn in the little village of Gorey beneath the castle. In front of this, vessels lie heeled over on their sides on the harbor mud, waiting idly for the rising tide. There are charming walks near at hand, when the single visit has been paid to the prosaic cromlech on the hill, where the old Druids celebrated their now forgotten rites.

Between the castle and St. Helier's is La Hougue Bie, a tumulary mound, overgrown with rhododendron, on which stands an ancient tower with several furnished rooms and a little chapel. This is one of the lions of Jersey (admission sixpence, and "please remember the guide, sir"). A quaint legend of treachery and retribution and wifely devotion is droned off by the small showman, and the visitor is conducted to the elevated platform, from which the charming freshness and beauty of the southeastern parishes are realized as from no other point, and where the best idea is gained of the insular character of Jersey, and of its nearness to the French coast.

It is not, after all, for its lions that one should visit Jersey, but rather for the great enjoyment of its lanes and home-like little farms. Any mile of its smaller roads is worth all else that it has to offer to those who are only in pursuit of pleasure; and, indeed, one who enjoys simple country things, and an air of foreign and unmodern quaintness, need seek no farther to find these in their most engaging and unspoiled form.

ST. CATHERINE'S BAY.

Naturally, one who visits this island will have much of his attention taken up by the town, and the people, and their institutions. It is not an attractive town, nor especially unattractive. Falle wrote, in 1693: "The chief Town is St. Helier, a neat, well-built Town, seated near the Sea, containing about a 1,000 Inhabitants, who are for the most part Merchants, Traders, and Artificers; The Gentry and People of the best Fashion living generally in the Country. Tis the ordinary Seat of Justice; and here is kept a Market, in the Nature of a Fair, every Saturday, where Gentlemen meet for Conversation as well as for Business." It is closely built, and has a busy air, and its population includes a large element of English families, who have been attracted here by a combination of climate, cheapness, and good schools; and, in the summer time, a more conspicuous element of cheap tourists. These are known as "Five Pounders," many of them being clerks spending their holiday weeks and their five-pound notes in noisy and unlovely pastimes. Happily they fill the great open excursion-cars and spend the whole day in the country. These cars, drawn by four horses, are of such width that they must needs keep to the broad roads, and their routes are easily avoided. In all our wanderings, we very rarely fell in with them.

HERMITAGE OF ST. HELERIUS.

This incursion of tourists and the large floating population have built up certain branches of trade to unexpected proportions. The port of Jersey is absolutely free (save for a slight impost on spirits); and wages and the cost of living are so low, that shopping is exceptionally cheap. Some of the shops are a surprise for their size and completeness. One establishment has every conceivable article of useful and ornamental furniture, including rare china and glass. Another shop, De Gruchy's, is larger and

more complete than any that I know in America, except two or three in New York, especially in its supply and variety of useful goods; it includes a capital tailoring establishment, and ladies' dresses and men's hats seem to be important branches. We found the prices of certain goods much lower than in corresponding shops in London, and could very well understand that, to a family man in need of an outfit, the æsthetic inducement is not the only one that Jersey holds out.

The native population of the town are English of the English, — in their dress and in their sentiment of nationality; but there lurk under the surface some qualities that betray the unmixed Norman blood that still fills their veins, — modified by eight hundred years of English nationality, but lacking the admixture of the Saxon and old Briton elements. In the presence of the world at large, the Jerseyman is an Englishman; but in the presence of the English he asserts himself (at least to himself) a Jerseyman. He is proud of his allegiance to England, but prouder still that he is of this choicest and oldest part of the English possessions.

The odd thing about this island, and the one that seems most incongruous, is, that the language of the people, especially in the country, but also very largely in the town, is French. We often met women and children on the farms who spoke no English, and in one very attractive photograph shop in St. Helier's we were asked if we did not speak French. Many of the market-women seem to be only sufficiently acquainted with English for the purposes of their traffic. The regular service in all the parish churches is in French, but there is in St. Helier's Church an afternoon service in English for the benefit of the garrison. The official language of the courts is French, but English suitors may examine witnesses and address the court in their own tongue. Official notices are posted in the two languages. The reading part of the population is more largely English, if we may judge from the fact that there are six English newspapers and only three French ones; this, however, may result from the fact that the newspaper is much more fully developed in England than in France.

One might pass some time in the town, in the usual way of tourists,

without discovering that he was not in an English community, but a trip to the country would soon inform him. The men and the younger women and the larger children speak modern French as their language of law and devotion, and English (usually less readily and perfectly) as their language of trade and business intercourse; but both tongues are in a measure foreign to them, while to the younger children and the older women they seem to be sometimes but little known, except for the routine of the church service. The language of the Jersey hearthstone — the "mother-tongue" of the country people — is French, it is true, but it is the French of the days of the old Dukes of Normandy; that which was carried by the Conqueror into England, and may be better described as the Anglo-Norman. It is essentially the same language as that of the present country population of Normandy, save that this has some engraftings of modern French, as that of Jersey has of English.

The modern language of Jersey (we have hardly the right to call this cradle of our own tongue a *patois*) is illustrated by the following specimen: "J'ai bain des fais paslait a mes ammins à l'endrait d'esl'ver un monueusment à s'nhonneu, mais chest comme si j'm'capuchais la teste contre la pathé, ils ont poeux desmonaizir quicq' herpins, — eh! Mon Gui, il en laissont drièthe ieux d'ches fréluques, nou n'les mettra pou à lus servir d'ouothilli quand nou les pliache 'cha dans lues dernièthe grande naithe casaque et que nou il'z'envietha à s'er' poser dans l'bain grand Gardin à noutr' ammin le Ministre Fillieu."

In modern French this would be: "J'ai bien des fois parlé à mes amis au sujet d'élever un monument à son honneur, mais c'est comme si je me cognais la tête contre un mur, ils ont peur de dépenser quelques sous, — eh! Mon Dieu, ils en laisseront derrière eux de ces fréluques, on ne les mettra point à leur servir d'oreiller, quand nous les placerons dans leur dernier grand habit noir, et qu'on les enverra se reposer dans le beau grand jardin de notre ami le Révérend Filleul."

A knowledge of French helps hardly at all to an understanding of Jersey French when spoken. It is a rude language, and seems not out of place among the poorer people, but it is odd to hear it familiarly used by educated persons; yet in the most aristocratic families it is the

language of the household. We once asked our way of an old woman who was working in her garden. Pointing to the left, she told us to go "too gowshe" (*tout gauche*). We addressed very few who could not speak modern French, but the knowledge of English is much less common than would seem possible in an island so small that no house is more than about ten miles from a large town, where it is so generally used that it seems at first the language of the place.

Jersey is an outpost of England rather than an integral part of the Empire. It is under the protection, rather than under the control of the Crown, which appoints (and supports at its own cost) a Lieutenant-Governor, who is a military officer of high rank, and commander of the considerable garrison, which is maintained without charge to the population. Acts of Parliament are not binding unless they have been specially sent by order of Council to be registered in the island. For most purposes, the local legislature ("The States of Jersey") is an independent authority, but their acts are passed "subject to the sanction of Her Most Excellent Majesty in Council." If not approved, they lapse three years after their enactment, but may be renewed from time to time.

The chief local officer is called the Bailiff. He with twelve Jurats (one from each parish) constitute the Royal Court, and these, with the twelve rectors, twelve constables, and the fourteen deputies, elected, one from each parish, and two additional from St. Helier's, form "The States of Jersey." The Bailiff presides, and he has the casting vote; but the States cannot be convened without the consent of the Governor, who has the right of veto, — rarely exercised, for this official, if he be wise, confines himself mainly to the affairs of the garrison, to the management of the militia, to the enjoyment of his beautifully placed country-seat on the hill back of the town, and to systematic entertainments.

The bailiff, the jurats, and the rectors hold office for life; the bailiff and the rectors are appointed by the Crown, and the jurats are elected by the rate-payers. They are not required to have legal qualifications, but certain occupations disqualify, such as butcher, baker, and innkeeper. When sitting in the Royal Court, the bailiff and the jurats wear robes of red cloth, which are more or less suggestive of bathing-

dresses. In this snug little republic, the *vox populi* is not so much expressed at the ballot-box as in the close intercourse of all classes, which must make the will of the people clear to their rulers, — who are born Jerseymen themselves and who, probably, value the approval of their fellow-islanders beyond all other worldly incentive to right-doing.

Even-handed justice, according to the laws, seems to prevail, if we may judge from the fact that on the occasion of our visit a former jurat was in prison, and awaiting trial before the body of which he had lately been a member. So far as I could understand the case, his crime was that of having declared a dividend when the bank of which he was a director was in an insolvent condition, though in a fair way to pull through if a good dividend should have the effect of putting up the price of its shares and attracting depositors. How would such a test of crime apply in our republic?

I was one day talking with a Jersey gentleman about this case, and asked him how in such a community so large a failure was possible, suggesting that the affairs of the bank could hardly be kept from the knowledge, nor, in a measure, from the control of many of the best people. He replied, sadly, and without enlightening me: —

"Ah! You see, it was a Dissenting bank."

Among the more peculiar laws is one affecting debtors. When a man is unable to pay his debts, he may be forced to "make cession"; that is, he gives up his entire assets to his creditors. The one whose claim is the most recent has the option of taking the property on paying the other creditors. If he refuses, his claim is annulled, and the next in order of time has the opportunity, which he must accept, or forfeit his claim; and so on, until, from the extinction of a portion of the debts, a creditor is found who will pay what remains and take the estate. By the operation of a recent law, a debtor may be released by consent of the majority of his creditors.

Jersey is much sought, especially by invalids, by reason of its equable climate. Much of its natural beauty, too, as well as the character of its ornamental planting, is due to its soft skies and mild winters. Changes

ROCK AT BEAU PORT.

of temperature are not often sudden or severe. The summer weather is rarely hot, and the winter is never cold. The fuchsia is a hardy shrub, and grows to a great size; it is much used as a hedge plant; pampas

grass is conspicuous in every lawn, and grows to dimensions which in our climate are quite unknown; the araucaria grows in the open air, and reaches a fine size; maidenhair and hart's-tongue fern grow wild on the fence banks; the oleander, the agave, the yucca, and the azalea flourish in private grounds beside the rich vegetation of New Zealand and the Norfolk Islands. In the grounds of Mr. Gibaut, in St. Laurence valley, there are dozens of large trees of camellia japonica, which bloom throughout the winter in the most magnificent profusion, and these are everywhere successful in the open air. Against south walls the orange ripens its fruit. The geranium is perfectly hardy, and, indeed, very many plants which can be grown only under glass in England, and only with fire-heat here, succeed perfectly in the open air in Jersey. The grass is green all winter, and many sorts of trees hold their leaves very late. I have seen the laurestinus bursting its flower-buds early in December, and the whole air of the island, except on the exposed northern and western coasts, is that of a country where one may have a perpetual conservatory at one's door, roofed only by the kindly sky.

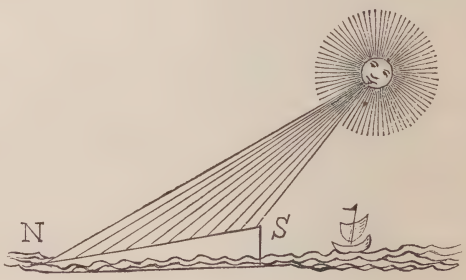
There is no miasma, and the air is not depressing, as might be suspected. On the contrary, it is a perfectly satisfactory climate for walking, quite as much so, and even more constantly so, than that of England. Consumption in its early stages is said to be checked by a residence here, and many chronic diseases yield to the effect of the wholesome air and the out-of-door life. Rheumatism, however, is said to be aggravated. Ansted, in his work on the Channel Islands, says: "It may safely be assumed that all the islands are admirably adapted to restore the health, and strengthen, both mentally and bodily, the overtaxed energies of the inhabitants of great cities. They afford a pure, clear atmosphere, containing a large quantity of saline matter and iodine, and the frequent high winds insure a constant freshness, preventing the depressing effect sometimes accompanying humidity."

Falle, the historian of Jersey (Rector of St. Saviour's), after descanting on the advantage to the island of having its slope all in one direction, so that the rivulets gain sufficient size to turn "betwixt 30 and 40 mills that supply the whole country," says: "The second Benefit we receive

from this Situation is that by this Declivity of the Land from N to S, the beams of the Sun fall more directly and perpendicularly thereon than if either the Surface was level and Parallel to the Sea, or which is worse, declined from S to N, as it doth in Guernezey. For there, by an odd opposition to Jersey, the land is high on the S, and low on the N, which causes, if I may so speak, a double obliquity; the one from the Position of the Sun itself, especially in time of the Winter Solstice; the other from the Situation of the Land; and is probably the Reason of the great Difference observed in the Qualities of Soil and Air in both Islands." He illustrates his meaning by two woodcuts, which are here reproduced.

JERSEY.

GUERNEZEY.



The quaintness of Falle's style only adds to his interest in the estimation of the student of Jersey. The roads lose nothing from his account of them. They were of three kinds: 1. "Le Chemin du Roy," twelve feet wide; 2. "Le Chemin de huit pieds," eight feet wide; and 3. "Le Chemin de quatre pieds," four feet wide, "serving only for Carriages or Horseback." "And yearly about Midsummer, there is a Perambulation of the Magistrates in one or more of the Parishes to inquire in what Repair these ways are kept, which is performed very Solemnly. The Constable of the Parish where the Perambulation is to be, takes with him 12 of the Principal Men of his Parish, and meets the Judge attended by 3 or more of the Jurats on Horseback: Before whom rideth the Viscount or Sheriff, with his Staff of Office erected, one End thereof

on the Pommel of his Saddle. In ancient times it was *Cum Lanceâ*, with a Launce. He keeps the middle of the way, the Constable and his 12 Men walking on foot by his side; and when his Staff encountereth with a Bough or Branch hanging on the way, the Owner of the hedge is fined: But if the fault be in the bottom of the way, not the Party bordering but the Over-seers of that Tything are amerced.

"We had anciently another way, and of very different Use, called *Perquage* from the word *Pertica* because it was exactly 24 Foot broad, which is the measure of a Perch. There were but XII of them in the whole Island beginning one at every Church, and from thence leading straight to the Sea. The Use of them was to conduct those who for some Capital offence had taken Sanctuary in any of the Churches and had been forced to abjure the Island according to an ancient custom practised among Us in those days. Having abjured, they were conducted by the Church-men along those *Perquages* to the Sea, which Perquages were still a Sanctuary to them; for if they strayed never so little, they lost the benefit of the Sanctuary and were liable to the Law."

Some of these Sanctuary roads are still the lines of the main roads leading to the churches.

Deploring the excessive use of "cidar," of which he estimates that there were made in good years twenty-four thousand hogsheads, all of which was consumed in the island "beyond use and necessity, even to Excess and Debauchery," he says: "Could Men be satisfied with the common Drink of Nature, Water I mean, no People in the World are more liberally stored with that than we of this Island: 'T is in my Opinion the great Wonder of this Island, that whereas it is as it were but a great Rock, standing in the midst of the Salt Sea, it abounds beyond what is seen in any other Country under Heaven, with fresh and excellent Springs, which gush out of the hard Rock, and bubble up everywhere, running in a thousand pretty Brooks and Streams among the Dales, till they lose themselves in that great Receptacle of waters, the Ocean. There is hardly a house that has not such a Spring or Brook near it."

Near the southwest corner of the island there is a high-lying, barren-looking stretch of sandy country, called the Quenvais, which is in strange

contrast to the rest of Jersey. Of this, the devout Rector, who never neglects a chance to point a moral, says: "We must except a large Tract of once excellent Lands in the West of the Island, which within these 200 Years have been so overrun with Sands, that the Island on that side beareth the Image of a Desart. This is said to have happened by Divine Vengeance on the Owners of those Lands, for detaining the Goods of Strangers that had been Shipwrackt on that Coast, though enjoyned by the highest Censure of the Church to restore them. There must be from time to time such publick Example of Divine Justice among Men, that *the inhabitants of the Earth may learn Righteousness.*" Then, his spirit of fair play asserting itself, he goes on: "And yet I confess it may't be also the Effect of a Cause not Preternatural: I mean of those high Westerly winds that blow here almost at all Seasons of the Year, and which on this side of the Island, are daily seen to drive the Sands from the Bottom to the Top of the highest Cliffs."

Outside of the towns the island is mostly divided into very small holdings. Inherited lands cannot be devised by will, but must follow the law of succession. Purchased property may be devised if there are no direct heirs to inherit it. The eldest son has, as his birthright, the house and about two acres of land (five vergées); he has, in addition to this, one tenth of the landed estate and rents. What remains is then divided, two thirds between the sons, and one third between the daughters. This law has effected a very minute subdivision, and even the consolidation of estates by purchase is much obstructed by a law that makes land liable for the debts of the former owner, even those contracted after he has sold it. One must know, in buying property, or in taking it on long lease, not only that the person selling or leasing, and his predecessors also, are solvent at the time, but that they are likely to remain so. With all its inconveniences, this law has had the effect of tying the people to the land more completely than is usual elsewhere. The soil owns the man, rather than the man the soil. The surplus population is taken up by the professions and by commerce, and very largely by the Newfoundland cod-fisheries. Many small estates are rented, and the rents are high, often fifty dollars per acre for entire farms.

There are very few farms of over fifty acres, — not more than six or eight in the whole island. From fifteen to twenty acres is the usual size of the larger holdings, but the majority of families make a comfortable support from very much less, — often from two or three acres. Nearly every one living in the country cultivates some land, no matter how little; if only a small garden-plot, he still raises vegetables for market. If he has two or three vergées, he keeps a cow and some poultry and swine. Consequently, one's wanderings in any direction outside of the towns are among an almost purely agricultural people. The "gentry" invariably cultivate their own estates, and indeed one is at a loss to learn where the gentry ends and the peasantry begins. The best names in the island are borne by the smaller landholders as well as by the larger, and cousinship links the population into a very compact community. One result is a much higher grade of intelligence among the very small farmers than would be expected; *noblesse oblige*, — to the extent that all feel themselves to belong in a higher social plane than their possessions would indicate, and that they strive to maintain their rightful dignity. The island directory, which contains the names of many who, from the smallness of their holdings, would be called peasants in other parts of Europe, is headed, "List of the names and addresses of the Resident Gentry." The ambition of this people to maintain a good position is furthered by their situation and natural circumstances. Their soil is fertile; the sea-weed is abundant, and is a capital manure; the climate is absolutely a perfect one; and they have the best market in the world (Covent Garden) almost at their doors, to say nothing of their own town, which of itself should be able to consume all their staple products. Add to all this the possession of a race of cattle popular throughout the world, and of which the surplus is eagerly bought at high prices, and we shall understand why the position of the Jersey farmer is exceptionally favorable.

Provincial pride always reaches its most stalwart growth in islands, and in Jersey it attains proportions which are perhaps justified by a peculiarly isolated position, and by the tenacity with which old traditions and customs are still preserved. This incentive seconds that of family

pride in stimulating the farmer, large or small, to the gathering of worldly gear, for which the soil is his only resource, and there results a thoroughly good agriculture, which has important lessons for us all. "High farming," in a small way, is as well exemplified here as in Belgium. Indeed, when we consider how much greater are the requirements of these farmers than are those of the Belgian peasants, and how comfortably they are supplied, we must confess that *petite culture* here reaches its best development. Le Cornu says: "A farm of twenty acres will, with few exceptions (where meadow-land or orchards predominate), be distributed as follows:—

Hay and pasture	10 acres.
Turnips	2 "
Mangolds	1 "
Parsnips	1 "
Carrots	¾ "
Potatoes	2 "
Wheat	3¼ "

"The stock usually kept will consist of:—

Horses	2
Cows	6
Heifers	6
Pigs	3

"To manage the above, and keep the whole in proper order, will require the constant attention of four persons,—two men and two women. In most cases the farmer has not recourse to assistance beyond that of his own immediate household. It is a rare occurrence for a tenant-farmer to hold a farm of this extent unless he can rely on his own family for assistance." "Ten Acres Enough" would have been a very commonplace title if the book had been published in Jersey.

The high farming is not of the sort practised in England, where a large capital is employed, and where everything is done on an extensive scale, but rather that of garden cultivation, where every acre is made to do its very best, and where deep ploughing, heavy manuring, and careful

attention produce their greatest effect. It is not to be understood from this that the farms are always neat and trim, and kept polished as if for show. On the contrary, they are very often untidy, and have an ill-kept look about the fence-corners, and tumble-down old thatch-covered stone sheds; but, as everywhere in this climate, the ivy creeps over all neglected ruin, and decks even the end of an abandoned pigsty with such masses of enchanting green and blossom that one is glad that the business of the fields and stables has left the farmer no time to improve away this wealth of roadside beauty. In our ruder climate, decay is more or less hideous; but under these softer skies, when man abandons his works, Nature takes them into her tenderest clasp and blends them with grass and tree until they seem a part of her own handiwork.

There are generally clusters of houses about the parish churches, and at no point is one often out of sight of habitations. Frequently several houses are grouped together, and the whole of the cultivated part of the island is more like a straggling village, than like the most thickly settled of our farming neighborhoods.

The country-houses are almost invariably built of stone, and the older ones are roofed with thatch or red tiles, — often with a combination of the two, — thatch on the upper part of the roof, and tiles near the eaves,

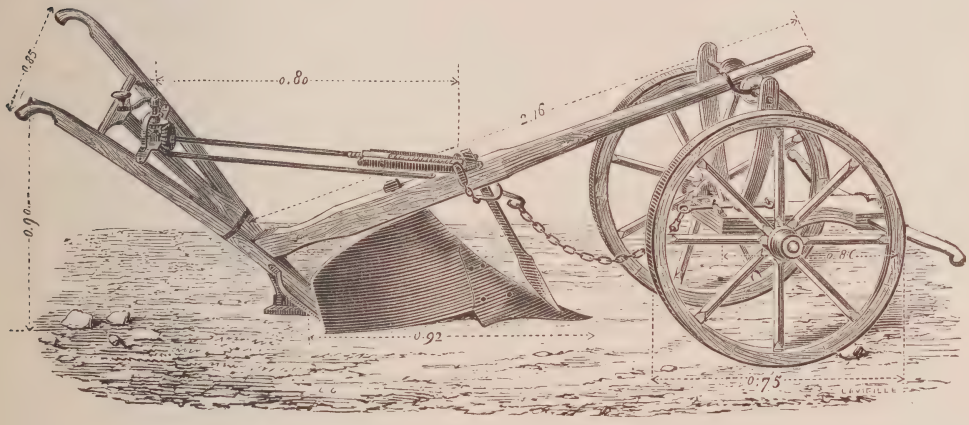
FARM-HOUSES IN ST. PETER'S VALLEY.

as shown on the larger house in the St. Peter's Valley view. Each place is well provided with outbuildings, such as bake-house, stable, cow-house, sties, sheds, barns, cider-house, store-houses, etc., conveniently arranged, and proportioned to the size of the farm. The fields contain usually from less than one to three acres of land, and are divided by huge banks of earth, often studded with trees. As land increases in value these are in some cases being levelled, and their place supplied by hedges. Orchards abound, and well they may, for cider forms the chief beverage of the poorer classes, and its importation is forbidden by law. This accounts, too, for the prevalence of the cider-house.

Some of the agricultural customs are peculiar, especially the Vraic Harvest and "La Grande Fouerie." Vraic is sea-weed, and the supply is almost unlimited. Probably more than thirty thousand loads are secured every year. The "vraic venant" — that which is washed ashore by the storms — is free to be taken at all times between sunrise and sunset. The "vraic scié" is that which is cut from the rocks, and the harvest is regulated by law or by a hallowed custom. There are two cuttings each year, the first beginning with the first new or full moon after the first day of February, and lasting five weeks; and the second beginning in the middle of June, and terminating absolutely on the last day of August. For the first month of the summer cutting the privilege is confined to the poor, who, however, may take only what they can carry in their arms beyond the line of the spring tides. The first day of the cutting is a general holiday. Crowds collect about the rocks and cut all they can (using a kind of sickle), throwing it into heaps until the tide turns. It is then, as rapidly as possible, carried beyond the reach of the advancing waters. When the day's work is done, the different groups meet at some house of refreshment and have a dance and a frolic. Some of the vraic is applied directly to the fields and ploughed in, and some is dried for fuel, the abundant ashes remaining being sold at about fourteen cents per bushel for manure.

"La Grande Fouerie," or the *great digging*, is a custom peculiar to the Channel Islands. It is an application in field culture of the practice of "trenching" common in gardens, — that is, of a complete inversion of

the soil for a depth of fourteen inches or more, — but it is mainly done with ploughs. Neighbors join forces for this work, and make it a sort of "ploughing-bee." The plough used for the deeper part of the work is shown in the following cut. It is drawn by four, six, or eight horses, according to the depth desired. The operation is as follows: —



A JERSEY "GRANDE CHARRUE."

The trench-plough is preceded by a two-horse plough, which casts off a furrow up and down the middle of the field, and is followed by men with spades, who open a trench to the desired depth, neatly squared to a width of two feet, the earth being scattered at each side. After the small plough has begun its next turn the bottom is dug out to the full depth for a few feet by hand, to allow the trench-plough to begin at the bottom of the furrow. The two-horse plough cuts off and turns into the bottom of the trench about four inches of the freshly manured turf, and the trench-plough turns upon it the whole ten inches or more that it cuts from the deep subsoil. Each deep furrow is begun, and its end is squared up, by hand. In this manner the whole field has its soil deeply reversed. This deep cultivation is the preparation for the parsnip-crop, which is a very important one in all the islands. It is considered by some good farmers in Jersey as quite unnecessary, and they claim to raise as good crops without it as with it; but it must have positive merit in many cases, or it would not have prevailed, as it has, for gen-

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erations. When the character of the subsoil admits of its adoption, it must, at least, have the ultimate result of deepening the staple, and so of greatly improving the soil. It would be fair to assume that it has had much influence in producing the fertility for which the land is noted.

Charming though this little island is in every respect, and however engaging to the general tourist, it is only the farmer who can fully appreciate its most celebrated attraction, — the one which has made it noted throughout the agricultural world. I refer to the beautiful and excellent Jersey cow (miscalled the "Alderney"). It was for the sake of its cattle that I made my first visit to Jersey, as it was for the sake of the rural beauty and historical and social interest which the first visit had revealed that I made a second and longer one. This gave opportunity for gaining a better knowledge and fairer estimate of the real merits of these animals, and confirming a belief that no better service can be rendered in an important department of American agriculture than by making still more widely known the benefit which would result to our butter-making farmers from the general adoption of this breed.

THE JERSEY COW AT HOME.

The origin of these cattle is exceedingly obscure. They probably came first from Normandy and Brittany with the early settlers, perhaps a thousand years ago; but their characteristics are now quite different

from those of the animals of the mainland, and are doubtless an outgrowth of climate, soil, and habit. If we could imagine France to have been the centre from which the cattle spread with the movement of the Gauls to the east and south, and of the Normans to the Channel Islands, we should find a remarkable instance of the development of original characteristics in opposite directions. Throughout Eastern France, Southern Germany, and Northern Italy the cattle are very largely — in some wide districts almost universally — of solid color, with black switches, mealy noses, and rather coarse horns. They are somewhat larger and more beefy than the animals of Western France; and as even the cows are regularly worked, their product of milk seems to be neither very large nor very rich. In the Channel Islands, while the same general characteristics are to be traced, the question of color has obviously been disregarded, and a large majority of the cattle have more or less white disposed in patches, white switches more often than not, white legs and feet, finer horns, and much less size and fleshiness; on the other hand, they are, for their size, very large milkers, their milk is of an extreme richness, and their leanness and general want of force are such as might be expected of animals which do no work, not even the comparatively light work of roaming over pastures.

Perhaps if we were to seek for the radical cause of the great difference in flesh and in milking quality between these animals and their more eastern congeners, we should find it in this very question of physical work. The theories on the subject are not sufficiently well established for scientific certainty, but it seems probable that the development of muscle by physical exercise tends to divert the nutriment of the food to the formation of flesh, leaving less to enlarge the quantity and enrich the quality of the milk. Perhaps, too, the degree to which the fat-forming portions of the food are converted into cream in the udder bears some relation to the demand which the lung-action makes upon these substances to supply carbon for oxidation in the process of breathing. It is a well-known fact that a cow driven long distances to and from pasture produces less butter than one leading a more indolent life, and the inference is that the increased respiration in this case consumes

hydrocarbons of the food, which, if not so destroyed, would be converted into butter. Assuming this to be true, may we not infer that an animal whose lungs have been enlarged by generations of work or active exercise, breathing more largely because of greater lung capacity, oxidizes and expires a larger amount of the very elements required for the production of butter? However true this theory, the facts on which it is based are unquestionable. The similarity of type between the cattle of Jersey and those of South Germany, and the fact that in the one case where they remain indolent throughout their whole lives, and in the other where they are almost constantly at work in the yoke, their yield of butter is very different, would seem to indicate the soundness of the reasoning.

Before the beginning of this century, say more than one hundred years ago, the cattle of Jersey had a well-recognized character as a distinct race, peculiarly adapted for butter-making, and qualified by their great docility for the system of small cultivation which has always characterized that island. As long ago as the year 1789 they were considered so superior for the uses required in Jersey to any other known breed that an act of the local legislature was passed, by which the importation of all foreign-bred cattle — cow, heifer, calf, or bull — was prohibited, under heavy money penalty, in addition to the forfeiture of the vessel and its tackle, and a considerable fine to be imposed on every member of the crew who did not inform the authorities of the attempt to violate the law. Every animal so arriving was decreed to be immediately slaughtered and its flesh to be given to the poor. Subsequent enactments have been equally rigorous, and no foreign cattle are allowed to be landed in Jersey except as butchers' meat. This restriction does not apply to cattle from the Island of Guernsey; but these are so little esteemed by Jerseymen that there are rarely a dozen Guernsey cows to be found in the whole island.*

* It is only fair to say that the farmers of Guernsey reverse this estimate, and have no high opinion of Jersey cows. This mutual prejudice has almost the effect of a legal enactment to prevent an interchange of stock between the two islands. The writer has been unable to learn that there has ever been an interchange of *bulls*.

Aside from this prohibition against the importing of cattle of other races, there seems to have been no regulated effort to improve the breed until about 1834, when a committee of the Jersey Agricultural Society selected two of the finest cows as models. One of these was held to be perfect in her head and fore-quarters, and the other in her udder and hind-quarters. From these two animals there was drawn up a scale of points to guide the judges at the Island and Parish Exhibitions in selecting the best animals among those competing for prizes. The scale of points thus determined upon, with one or two unimportant additions since made, will be given in another part of this chapter.

So strong was the adherence of the Jersey farmers to the single point of milking-superiority, that for a long time, and in many cases even to the present day, they sought no further. Their cattle had always possessed the deer-like head, the fine, crumpled horns, the yellow secretions in the ears, the soft eyes, the lean throat and neck, the light frame, the fine tail, and, above all, in the better specimens, the large, well-formed udder, with prominent, knotted milk-veins, which indicate the largest and richest production at the pail. Even now there are to be found in Jersey a very large number of ill-formed, slab-sided cows, hollow-backed, cat-hammed, and sloping at the rump, which show how largely the points of beauty have been neglected.

Nevertheless, the stimulus of the English and the American demand, and the desire for success in competition at the periodical shows, have had, and are still having, a great influence on the form of the animal. The awkward, ungainly shapes are disappearing, and there is a constant improvement in general outline, though even to this day the great point to be considered in all breeding in Jersey is the production of a good yield of butter. This has been somewhat interrupted during the past few years by the mania for dark colors; but the mischief thus caused promises to be fleeting, and, under the strenuous efforts of the Society to discourage this folly, it is not likely that any serious injury to the race will result.

Whatever may have been the origin of this race (and what is said above is only one of the theories on the subject), their development to

their present condition is a natural outgrowth of the circumstances under which they have been kept.

To understand this properly is important to all breeders of the race in this country, for the reason that, so far as we are to continue the improvement under influences similar to those which operated for so long a time in the development, we should, as nearly as our conditions will allow, conform to the circumstances of the original breeding and treatment. The Jersey cow is a product of the Island of Jersey, — of its soil, its climate, its system of agriculture, the circumstances of its farmers, and the needs of the dense population there concentrated.

It is under the fostering influence of the careful agriculture and of the genial climate that the Jersey cow has grown to be what she is, — a small, docile, useful, domestic animal. She has long been jealously guarded by the Jerseyman as the best cow in the world for his purposes, and it was a wise decision which led the legislature to confine the improvement of the race within the line, rather than yield to the infusion of alien blood. The secret of their great development in the matter of the production of cream and butter has been sought in the fact that perhaps for hundreds of years no other characteristics were considered in their selection. The old unimproved cattle, of which specimens are still to be seen on the island, were exceedingly awkward and ungainly, and had little to recommend them besides their little heads, which no neglect had been able to spoil, and their all-important quality of rich productiveness.

Their most useful characteristics are the effect of continual breeding for a useful result; but their gentleness, their docility, and their beauty — which, when we consider their adaptation for family use, are of an importance only second to this — are due to long generations of kind personal care, and of the constant presence of man, or rather of woman; for in Jersey the women take almost exclusive charge of the cattle. From their very birth these animals are never at liberty; when in the fields, they are always tethered by short ropes to stakes in the ground, and are removed several times a day to fresh grass; they are led to water, and they are led to the stable.

Bearing in mind the smallness of the island, and the fact that it has over two thousand land-owners, one may well be surprised to learn that the census of 1872 returned nearly eleven thousand head of horned cattle as being kept there.

We cannot better describe the local methods of feeding and management than by quoting the account of Mr. Le Cornu given in an essay on Jersey agriculture: —

"In order to derive the greatest possible advantage from his cows, the Jersey farmer endeavors to arrange for them to calve during the first three months of the year; that is, when vegetation speedily advances. In the winter cattle are always housed at night; when they come in (about four o'clock in the afternoon), they are milked, after which each receives about three fourths of a bushel of roots and a little hay; they are then left until eight o'clock, when a bundle of straw is given to each one. The following morning they are attended to at six o'clock, or even before that hour; having been milked, they again receive the same allowance of roots and hay as before mentioned, and at nine o'clock are turned out; if fine, in some sheltered field or orchard; then the stables are cleaned out, and the bedding renewed, if required. Cows are dried one month or six weeks before calving. Bran mashes are given to them about the time of parturition, and continued for a fortnight after the calf is born; at no other time do they receive this food. Bull-calves intended for the butcher receive the cow's milk for about a month or six weeks; then they are considered fit for sale. A good calf will sell for about fifty shillings, some for more, but many for less. If the calf be a heifer, she is always reared and kept in the island until she is two years old, when, if not required, she is sold for exportation.

"Returning to the cow: two weeks or so after calving, if the weather be very fine, she is turned out to grass in the daytime. It is the custom in all the Channel Islands to tether cattle. The tethers are made of small chain; a spike about one foot long is attached at one end and driven into the ground; the other end is tied to the cow's halter, the latter being made fast at the base of her horns; the length of these tethers is altogether about four yards. During the day cattle are fre-

quently moved, generally every three hours, and sometimes oftener; drink is given to them in the morning on leaving the stable, and at noon; if it be summer-time, they receive it also in the evening. About the month of May they are allowed to remain out at night, and continue so until the end of October, when the system of housing above described recommences. During summer cows are frequently milked three times a day; and when the weather becomes very warm, they are brought into the stable for a few hours, else they would be tormented by flies. At this period (height of summer) a great diminution takes place in their milk; but as the heat ceases toward the fall, it rapidly springs up again to what it was in the spring. This is the time when butter is crocked for winter supply. A cow is in her prime at six years of age, and continues good until ten years old; many are kept that are much older, but then they begin to fall off. A good cow on the average gives fourteen quarts of milk per day, or eight or nine pounds of butter per week; instances are common of cows giving twelve, or even fourteen pounds of butter in one week, but that is above the average figure."

SCALE OF POINTS

As adopted by the Royal Jersey Agricultural and Horticultural Society.

COWS AND HEIFERS.

Article.	Points.
1. Head, small, fine, and tapering	1
2. Cheek, small	1
3. Throat, clean	1
4. Muzzle, fine, and encircled by a light color	1
5. Nostrils, high and open	1
6. Horns, smooth, crumpled, not too thick at the base, and tapering	1
7. Ears, small and thin	1
8. " of a deep orange color within	1
9. Eye, full and placid	1
10. Neck, straight, fine, and placed lightly on the shoulders	1
11. Chest, broad and deep	1
12. Barrel, hooped, broad and deep	1

13.	Well-ribbed home, having but little space between the last rib and the hip	1
14.	Back, straight from the withers to the top of the hip	1
15.	" straight from the top of the hip to the setting-on of the tail, and the tail at right angles with the back	1
16.	Tail, fine	1
17.	" hanging down to the hocks	1
18.	Hide, thin and movable, but not too loose	1
19.	" covered with fine, soft hair	1
20.	" of good color	1
21.	Forelegs, short, straight, and fine	1
22.	Forearm, swelling, and full above the knee	1
23.	Hind-quarters, from the hock to the point of the rump, long and well filled up	1
24.	Hind legs, short and straight (below the hocks), and bones rather fine	1
25.	" squarely placed, not too close together when viewed from behind	1
		1
26.	Hind legs not too close in walking	1
27.	Hoofs, small	1
28.	Udder, full in form, i. e. well in line with the belly	1
29.	" well up behind	1
30.	Teats, large and squarely placed; behind, wide apart	1
31.	Milk-veins, very prominent	1
32.	Growth	1
33.	General appearance	1
34.	Condition	1
	Perfection	34

No prize shall be awarded to cows having less than twenty-nine points.

No prize shall be awarded to heifers having less than twenty-six points.

Cows having obtained twenty-seven points, and heifers twenty-four points, shall be allowed to be branded, but cannot take a prize.

Three points — namely, Nos. 28, 29, and 31 — shall be deducted from the number required for perfection in heifers, as their udder and milk-

veins cannot be fully developed; *a heifer will, therefore, be considered perfect at thirty-one points.*

A similar scale is used in judging bulls.

Any one in America, where real experience with Jersey cattle is hardly more than twenty-five years old, ought to be very modest about criticising a standard set up forty years ago by the best men in Jersey, who had a life-long experience and the much older traditions of their neighborhoods to guide them. At the same time, much attention has been given to this subject by the members of the American Jersey Cattle Club, and a tolerably full and careful discussion has occupied the attention of some of our best breeders for several years, and it may be in place here to refer to some of the points under consideration, and to state the reasons why a change seemed desirable.

It was urged that the Jersey scale of points has the radical defect of giving the same prominence to unessential points that it does to essential ones. For instance: if a cow has her nostrils high and open, that counts one in the competition with others; if her udder is full in form, — that is, well in line with the belly, — that most valuable of all characteristics also counts but one. By the scale, a prize might be awarded to a cow whose teats are small, and so close as to be even grown together; whose udder is hardly apparent from behind, and is cut off in front like a goat's udder; whose hide is coarse and tight, and whose milk-veins are scarcely apparent: while one absolutely perfect in all these essential respects might be refused a premium because her muzzle is not fine and encircled by a light color; because her ears are large and coarse, her back is not straight from the withers to the top of the hip, her rump slopes, and her tail does not reach to the hocks. This objection is the most serious one, but there are other points which made it seem best to alter the scale. Many of the very best cows have large hairy ears. It is prescribed that the chest should be broad and deep: this indicates large lungs, and large lungs, beyond what is necessary for a good constitution, are considered to be one of the defects, for dairy purposes, of animals whose respiratory organs have been much developed by the vigorous breathing caused by too active exercise. It is also prescribed that

the cow should be closely ribbed, having but little space between the last rib and the hip. As an element of symmetrical beauty this may be desirable; but probably an examination of the best milkers in any large herd would show them to be very loosely put together in this respect, and to have very roomy flanks. So, too, it is believed by many judges that while the hind-quarters should be long from the hock to the point of the rump, they should not be, as prescribed, well filled up, but should be extremely lean and hollow.

Since the Jersey scale of points was formed, the discovery of Guénon has come into prominence, and the escutcheon or milk-mirror is quite generally believed to be an indication of the milking qualities of the cow. While this system is not universally accepted, its adherents are very strongly of the opinion that the escutcheon should have an important place in the scale of points. The writer's own observation among cattle-men in different countries has convinced him that those who attach the least importance to this indication are those who have given the least study to these details. He has never met a breeder in Jersey, in Holland, in England, or in America, who has learned to apply Guénon's instructions in full detail, who disregards it in his purchases or in his breeding.

The following is the Scale of Points which has finally been adopted by the American Jersey Cattle Club:—

SCALE OF POINTS FOR COWS.

Points.	Counts.
1. Head, small, lean, and rather long	2
2. Face, dished, broad between the eyes, and narrow between the horns	1
3. Muzzle, dark, and encircled by a light color	1
4. Eyes, full and placid	1
5. Horns, small, crumpled, and amber-color	3
6. Ears, small and thin	1
7. Neck, straight, thin, rather long, with clean throat and not heavy at the shoulders	4
8. Shoulders, sloping and lean; withers, thin; breast, neither deficient nor beefy	3

9. Back, level to the setting-on of tail, and broad across the loin	4
10. Barrel, hooped, broad and deep at the flank	8
11. Hips, wide apart, and fine in the bone; rump, long and broad	4
12. Thighs, long, thin, and wide apart, with legs standing square, and not to cross in walking	4
13. Legs, short, small below the knees, with small hoofs	3
14. Tail, fine, reaching the hocks, with good switch	3
15. Hide, thin and mellow, with fine, soft hair	4
16. Color of hide where the hair is white, on udder and inside of ears, yellow	5
17. Fore-udder, full in form, and running well forward	8
18. Hind-udder, full in form, and well up behind	8
19. Udder, free from long hair, and not fleshy	5
20. Teats, rather large, wide apart, and squarely placed	6
21. Milk-veins, prominent	5
22. Escutcheon, high and broad, and full on thighs	8
23. Disposition, quiet and good-natured	3
24. General appearance, rather bony than fleshy	6
Perfection	100

In judging heifers, omit Nos. 17, 18, and 21.

The same scale of points shall be used in judging bulls, omitting Nos. 17, 18, 19, and 21, and making moderate allowance for masculinity.

Note. — It is recommended that judges at fairs do not award prizes to animals falling below the following *minimum* standard, namely: Cows, 70 counts; heifers, 55 counts; bulls, 50 counts.

We have already seen what are the circumstances and conditions under which the Jersey cow has been brought to her present state of excellence in her native home. An influence has been exerted by the character of the recent foreign demand which has had great effect upon the course pursued by breeders in Jersey, and, consequently, upon the character of the animals they breed. In 1872 there were no less than 1,896 breeding animals exported from the island; in 1871 the number was somewhat larger. Indeed, the sale of stock to supply the foreign demand is a very large item of the farmer's income, and naturally any-

thing that is especially required by the market must be supplied by the producer.

By some process which it is difficult to understand, there has grown up, especially in England, a demand for animals of uniform color, — that is, free from any white marking; high prices have been obtained in the English market for "solid" colors, black switches, and black tongues, rather than for large udders, full milk-veins, and the fine, delicate organizations that indicate large and rich milking. At the time of the formation of the American Jersey Cattle Club this same fancy was beginning to take root among the breeders here; but it is believed that wiser counsels are prevailing, and that the selection of animals is now being based on more useful characteristics. The injurious effect of catering to this taste has become so apparent in Jersey that the Agricultural Society there is combating it as actively as possible, believing it to be a suicidal practice which, if persisted in, can only end in the destruction of the qualities which have given the race its chief value.

Two or three years ago it was almost impossible to find in the whole island a young bull which had not the fashionable solid color and black points. The writer, being shown a magnificent cow with liberal patches of white upon her, and almost staggering under the weight of a large and handsome udder, asked to see her calf. He was told that it was a bull, and that as it had some white marks, and was therefore unsuited for the English demand, it had been killed. The owner of this cow afterward showed, with evident pride, a light-gray bull-calf with a black switch, for which he expected to obtain a "long" price, but whose dam was a very inferior milker and the least promising as a dairy-cow of the whole herd.

It is by no means asserted that the so-called "fashionable" color is in any way incompatible with the best dairy quality; but it is urged very strongly that it will never do in breeding cattle *for a given purpose* to take as a standard any point that is not indicative of excellence for that purpose. Such a point, in breeding dairy-cattle, is certainly not the color of the hair and switch, and any considerable knowledge of Jersey cattle must convince the most enthusiastic Black-Point man that if the

selection is to be confined to animals having his favorite markings, there must be excluded a very large proportion of the finest dairy animals of the breed. Formerly a breeder showed with pride the rich yellow skin underlying the white hair upon his favorite cow, and it seems a pity that this valuable indication of high-colored butter should be lost. The question of beauty is a question of taste, and questions of taste are not to be discussed; but those are not few who still think that a herd of Jersey cattle is more attractive and is better constituted to make a fine show in a pasture for being variously colored and variously accentuated with white. The argument here presented is, however, based not at all upon the question of taste, but entirely upon the more practical one of the amount of butter to be yielded by the cow. It is firmly believed that the road to the greatest possible excellence in this respect lies through a selection which shall have its range over the whole breed, and shall not be confined to such specimens as are of a particular coloring.

In the first volume of the island "Herd Book" there were entries of 124 bulls and 474 cows; 41 of the bulls and 106 of the cows being "highly commended." Of these 147 animals, only 24 are said to have black switches, and only one to have a black tongue; only 45 are of solid color, or nearly so. These indications, as well as the other markings, such as white switches or white patches, are not considered as points of excellence, but obviously only as distinguishing marks.

Even at that time no especial importance was attached in Jersey to the question of color, which is, without doubt, a dealer's question. It is no slight matter to teach a novice what constitutes a good cow, nor, after he is taught, is it always easy to supply his requirements. It is easy to tell him (as he has been told) that solid color is the "correct thing": that a black switch has an elegant look; and that a bull with a black tongue is more likely to perpetuate the leading merits of his race than is one with a white one; and having adopted this as his standard, he becomes capital game for the dealers, for the market at St. Helier's furnishes a good supply of semi-worthless brutes having the desired color, and purchasable at very low prices, — not, let me again insist, that all or a very large proportion of the solid-colored animals are

worthless brutes; but that if a Jersey farmer happens to have one of these which is worthless, he knows that he will find a ready demand for it at the Saturday market in St. Helier's.

A farmer in Jersey, being asked his opinion on this subject, said: "My experience is that the light-colored cows are apt to be the best, and I always keep two with plenty of white about them for the dairy, and two without any white to sell calves from."

This question of color has been much harped upon during the past three or four years, and its extended treatment here has been at the risk of tiring the reader; but it seems a question of such vital importance, and, unless rightly decided, to forebode such disaster to our future breeding, that its consideration could not properly be avoided.

Another matter of no little importance in connection with the influence of the foreign demand on the breeding in the Island of Jersey is that of form, and here the American market has practically no influence; the great sale is to England, and the standard there set up seems to be entirely based upon the desire to take prizes at agricultural shows. England, with all its virtues and all its charms, has the great defect of seeing merit too often in mere size. The great, hulking, Shorthorn steer, fattened to a disgusting degree of grossness, is England's *beau ideal* of the bovine race, and the Shorthorn standard is that which seems to fill the eye of the whole agricultural community. The almost universal criticism of the Jerseys has been that they were lean, scrawny, and misshapen; and what are called the successful breeders — that is, those whose Jerseys carry off the decorations — endeavor to catch the eye of the judges by moulding their cattle as nearly as possible to the Shorthorn shape. Judging from the descriptions given of the prize-takers during the past few years, they must have been more like miniature Shorthorns than anything we know as butter-yielding Jerseys.

In the "Country Gentleman" of February 12, 1874, there is a communication from C. L. Sharpless, detailing his observations in England in the summer of 1873. From this I make the following extracts: —

"The ambition among exhibitors in England is to secure an animal of solid dark color, one that will lead out stylish; the mirror is overlooked,

and the qualities of the dam not regarded; but the animal must have no white, any of which color being on a bull-calf consigns him to the butcher." "Among all the stock of Jersey bulls in England, I did not find one with any mirror whatever, and this because that feature is not required by the judges at the shows." An exception is made of the herd of Mr. MacDonald, at Liphook: "It contained 69 milking cows — 34 in one field and 35 in another — all Jerseys, and some of them very choice. . . . . They appear to have been selected for yield, and are not 'solid color with black points.'"

"Besides the fact that the Jersey bulls of England are solid dark color and deficient in mirror, they are all beefy, and, though they lead out well at a show and get prizes, their daughters will count but little at the pail. The same applies to many of the cows, and there seems to be an instinctive yearning after the Shorthorn type. Those in this country that have the same craving can be suited with the Swiss cows, and especially with a herd of thirty or forty near the top of the Righi Mountain. These are handsome, large animals, stout and solid colors, mouse-colors, duns, drabs, all with black points, and with the exact features of the Jerseys, — a white fillet encircling the nose."

"Besides those above enumerated, the Fowlers, of Watford and Little Bushy, have constantly on hand a lot fresh from the island, and there are scattering smaller herds; but the conclusion I came to was that, with the exception of a few choice cows in MacDonald's herd, the stock of America would not be improved by importation from England."

If anything seems certain, it is that a cow which has a tendency to lay up fat in the carcass cannot have an equal tendency to secrete fat in the udder. The only reason which can justify us in breeding Jersey cattle with care is that we believe it to be for our advantage to perpetuate and to improve upon the special characteristics for which Jerseys are noted. These are emphatically not the beef-making tendency, but the disposition to produce a good flow of highly colored rich milk for the practical work of our dairies and for the supply of our tables; and (subordinate to this, but also important) the peculiar delicacy, beauty, and docility of the breed. If we seek these qualities, and seek to secure

their improvement, we are working in the right direction and with the right material. If, on the other hand, solid colors and black switches and well-rounded, beefy forms are our aims, we had better avoid the Jerseys altogether, and apply our efforts to the beautiful cattle of Switzerland and Northern Italy.

If we undertake to produce a race of solid-colored and black-pointed animals which shall also be enormous butter-yielders, we set ourselves a task of the most difficult character; if we aspire also to combine with these characteristics the rounded form of the beef-making animal, the difficulty rises to an impossibility, for the best milking quality is entirely incompatible with the disposition to make beef.

We cannot, perhaps, do much to check the tendency developed among breeders in England; but by adhering to the more prudent course in our own importations, we may, perhaps, do much to counteract the hurtful influence exerted on the island supply by the English demand.

Concerning the question of color enough has already been said; but opinions vary very much on the question of size, too much prominence being often given to the supposed advantage of mere largeness, — an advantage which becomes real when we are breeding for the butcher, but which may well be questioned in considering dairy results only. This subject is thus treated in the essay printed with the first volume of the "Register" of the American Jersey Cattle Club: —

"The question of size is doubtless of great importance, but there is no positive knowledge to guide our decision concerning it; at least, I am aware of no experiments that do more than to indicate which is the wisest course to pursue. So far as uncertain indications are to be relied on at all, they seem to point to medium size as the most desirable. Further experiments as to the advantage or disadvantage of large size are needed. Certain arguments in favor of the smaller size are worthy of consideration. In the case of pure breeding, where calves have a high value, more calves will be produced with the consumption of a given amount of food in the case of small cows than of large ones; that is, a larger number of cows can be kept. In a large herd of small animals it is easier to keep up, throughout the year, a uniform supply of milk and

its products, than where there are fewer animals of a larger size consuming the same amount of food. One great source of the demand for Jersey cattle is the necessity for a few quarts of milk regularly supplied for family use. A large Ayrshire or Dutch cow, giving four thousand quarts of milk during the year, will produce an oversupply during one season and go entirely dry at another. She will consume as much food as would support two little Jerseys giving each two thousand quarts of milk, one coming in in the spring and one in the autumn. In perhaps a majority of instances accommodation can be furnished for only one cow and food for only a small one. For such cases the smaller Jerseys are especially adapted, such as will give ten quarts of milk at their flush, and not fall below three quarts within six weeks of the next calving; the cream increasing in proportion, and becoming richer as the quantity of milk decreases, thus maintaining a satisfactory quantity for at least ten months of the year, and yielding enough for necessary use during the eleventh."

Dr. Voelcker, in his essay on milk, says: —

"As a general rule, small races, or small individuals of the larger races, give the richest milk from the same kind of food. Whether it is more profitable to keep small or large sized breeds is another question, of which we shall presently speak. Where good quality is the main object, Alderneys, perhaps, will give most satisfaction, for they give a richer cream than any other breed in common use in this country. The small Kerry and the miniature Bretons also produce extremely rich milk; but, of course, in much less quantity than the larger breeds."

The primary object in breeding the Jersey cow is, as in the case of all other dairy races, to secure a good cow, — that is, a good milk-giver and butter-maker; and the first point to be regarded is to see that those characteristics which in all cows indicate large milk-giving capacities are permanently preserved, and those which denote a tendency to the production of fat in the carcass and the production of beef, — that is, the grazing quality, — be avoided.

It may be taken as an axiom applicable to all cows, especially during the first three or four years of their lives, that a tendency to beefiness

is objectionable where the highest yield of dairy products is desired. In all works on cattle we find general directions for the selection of milking cows, which do not vary materially, and the leading principles of which should always be borne in mind.

There are some minor points of an empirical character which may or may not be of value, but which some practical dairymen rarely disregard. One of these is that the curtain or fold of skin below the flank should extend well down over the udder, and that the recess between it and the udder should be deep, this skin being also very soft and flexible. Another is that the skin on the belly immediately in front of the udder should be loose, soft, and easily drawn into deep folds. These are, after all, only indications of that general looseness of the hide which seems to belong to the more productive milkers of all breeds.

It would be out of place to enter here into a detailed discussion as to the value of the escutcheon, or milk-mirror, or to give directions for applying the system in practice. It is enough to say, generally, that, whatever its shape, the escutcheon should be large. In some cases it reaches quite up to and beyond the vulva, without much width below; and in others, without rising scarcely at all above the udder, it spreads out widely, like an apron, over the thighs. Probably in some cases, in which its development, as viewed from the rear, may seem somewhat restricted, it has a sufficient extent on the belly in front of the udder to compensate for this defect. The ideal escutcheon towards which we should all breed should wander well out over the thighs, and reach in a broad band quite to the setting on of the tail, its outline being uniform and well defined. Whatever may be the reader's opinion as to the value of the escutcheon, surely no one would pretend that such an escutcheon as this could be in any way detrimental, nor has the writer ever seen such a one on a cow which did not perform well at the pail.

It is impossible to give in writing such a description of a perfect Jersey cow as will enable an inexperienced person to select with judgment. The knowledge required comes only with experience, and experience produces its best result only in the case of one who has a natural aptitude for observing the characteristics of animals; but there is an air of kind-

ness, docility, generous feeding, and generous milking in the best Jersey cows which, when once recognized, can never be overlooked or mistaken, and which the skilful breeder will soon fix in his mind as the type towards which his efforts should be aimed, and the point from which (these having succeeded) his attempt at improvement should take its departure.

It is very well understood by all who have given attention to this race of cattle that, while the milk is somewhat less copious than that of other races, it is much richer in cream than that of any other with which we are familiar; that the cream has a higher color, and that its butter has the advantage of coming more quickly and of being more easily worked, and of being extremely firm and wax-like in its texture. In appearance it is everything that can be desired, and it is as amenable as any other to the influence of delicate flavors in the food, — it is, in fact, the *ne plus ultra* of butter.

Scientifically, there is not very much known concerning it. So far as I am aware, this interesting field is thus far mainly unexplored.

The much greater ease with which the butter of Jersey cows is manufactured, — the shorter time required for churning, the less amount of working needed to produce the proper consistency, and the less care required in sending to market in warm weather, — is of itself a strong argument in favor of the breed.

The facts set forth above are sufficient to demonstrate the adaptation of the Jersey cow to the needs of the dairy farm. They have been equally successful in all sections of our own country, and hold their own in Maine and California, in Wisconsin and Mississippi. With considerable facilities for knowing the estimation in which they are held in the different States, the writer would be at a loss to say that they are more popular, among those who are acquainted with their merits, in one part of the country than in another.

Hitherto their use has been largely confined to those who have kept them only partly, if at all, for profit; but during the past few years they have been rapidly finding their way among ordinary butter-making farmers.

The price at which pure-bred animals have sold has prevented the for-

mation of herds of thoroughbred cows to any great extent among farmers, but it is becoming so well understood that an infusion of Jersey blood greatly improves the butter-producing quality of herds of native cows, that an active demand is arising for bulls, and in this manner herds of Jersey grades are being formed all over the land. Whatever may be the future demand for thoroughbred females, there can be no question that bulls from the better class of cows will soon be quite as sure of a ready sale, and it is unquestionable that the country is in this manner to receive a very important addition to its agricultural wealth.

All things considered, there is no cow equal to a good Jersey as a "family cow," especially for use on small homesteads. She is small, docile, easily handled; is hardy, hearty, and easily kept; the long habit of the race has made her more patient of confinement than our other breeds; and a short tether on a well-grassed paddock is all that is required to maintain her in perfect health.

The quantity of milk yielded is, of course, much less than that of cows whose milk is not so rich, yet it is sufficient for the uses of an ordinary family, and its large quantity of rich and well-flavored cream gives, at little cost, a highly prized luxury.

For use under these circumstances the small size of the cow is of decided advantage. If only one animal is kept, the economy of food, when compared with that consumed by other breeds, is important; and owing to the persistence with which the production of milk is continued with an ordinarily good Jersey cow, the family will rarely be more than from six weeks to two months without a sufficient supply of good milk.

If a larger quantity of milk is required, two little Jerseys, coming in one in the fall, and the other in the spring, will keep up a constant supply the whole year round, and will consume not materially more than would one hulking native, producing a uselessly large quantity of thin milk during one season, and going entirely dry for months at another.

It would be ungracious not to regard what may be called the purely "fancy" use of this breed, since it is to this that we owe so large an influence in securing its early introduction; and however desirable the Jersey may become for the farm or for the household, she is not likely

to lose her pre-eminence as a decoration for lawn-pastures. Her deer-like beauty and aristocratic, thoroughbred air will insure the continuance of her position as the lawn cow *par excellence.*

We were at one time in danger of some disturbance of the even course of our judicious breeding by the threatened prominence of the demand for solid-colored animals; but this is happily passing away, and it is fast becoming understood that the typical beauty of this race includes as a prominent feature its constant tendency to vary in its marking. A herd of differently colored Jersey cows, of good breeding and in good condition, may well be thought to furnish the perfection of bovine beauty with which to set off the attractions of ornamental grounds; and, indeed, the marvellous charm of the scenery of the Island of Jersey, where the vegetation of every clime grows in luxuriance, and where the ivy clothes every neglected stump and stone and every mound of earth with its abundant foliage, is emphasized and greatly increased by the beauty and varied coloring of the animals tethered in every field and orchard.

The dairies of Jersey are rather curious than instructive. They are usually small, and their product is generally much inferior to that of American dairies where the same cows are kept. One Jersey practice might, however, with advantage be adopted here, — that is, the manner of milking. They milk, not into a pail, but into a narrow-necked, jug-shaped can, the mouth of which is closed with muslin, tied on so loosely that it sags down some inches into the opening. In the bottom of this is laid a clean sea-shell, to receive the stream of milk and prevent its wearing the cloth. The milk flows over the edge of the shell, and, as it passes through the cloth, is perfectly strained of any impurity that

STONE ANCHOR AND MARTELLO TOWER.

may fall from the cow's udder. When the milking is done in the stable, this cloth has the additional effect of excluding foul odors.

Small though the Island of Jersey is, our two weeks were all too short for more than a glance at the island, with its peculiar manners and customs; but "fresh fields and pastures new" invited us to Guernsey, and with real regret we gave up our little house, with its charming view, transferred our daily drives to our lasting memory, set sail on a summer sea, and saw this charmed land fade into a dreamy blue cloud behind us.

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CHAPTER VI.

GUERNSEY.

AS Jersey grew dim and blue behind us, the central group of the Channel Islands came slowly out of the smoky distance, their valleys deepening into shadow, and their cliffs growing into sunshine; houses gradually appearing, and woods and fields and hillside roads; and along the shore, the glinting of the far-off spray as it broke over the black bowlders that stretched far to right and left.

Guernsey lifted its front more and more out of the sea, and as we steamed past its majestic cliffs, it seemed an enchanted Lilliput, basking in the sunshine high up on the everlasting rocks. Away to our right lay the hazy silhouette of Sark, "wrapped in the solitude of its own originality."

MAP OF GUERNSEY AND SARK.

At the end of two hours' sail over a glassy sea, we rounded the breakwater at Castle Cornet and ran into the superb harbor of St. Peter Port, a harbor shut in from the sea by moles of massive granite. The tide was well out, and we disembarked at the lower story of the Landing

Stage, which was still wet with the receding waters, and went up the slimy stairway to the top of the pier. At the hotel we found the long-forgotten "Boots" of the English inn, and our lunch was of bread and cheese and beer. We seemed to have finally left behind us the close-adhering traditions of France.

The town of St. Peter Port (or Peterport) is built on a steep acclivity, up which its streets wind at an angle that, before the recently built fine modern road was opened, must have been the despair of the overloaded horses fated to drag supplies to the upper part of the town. So far as we were able to judge from a few days' observation, St. Peter Port is without especial interest for the tourist, — only decent and comfortable, and with good markets and fair shops, — a useful rather than an ornamental town. Before the building of the fine esplanade that now skirts the harbor and the shore, there were many picturesque old tumble-down houses, whose loss can only sadden the traveller, as it must delight the sanitarian. The blessings of fresh air, sunshine, and healthfulness must compensate for the rickety charm of old "Cow Lane," which has gone forever. The Town Church, though badly placed in the lower part of the town, is well worth a visit. It is very old, but has been restored without being spoiled, and is much the finest ecclesiastical building in the Channel Islands.

The area of Guernsey is about fifteen thousand acres, two thirds of which are under cultivation. The population is about thirty thousand, more than one half of whom live in St. Peter Port.

The tourist soon learns that he is far from having lost the French characteristics so prominent in Jersey, for here it is only on that edge of the social plane which is in constant contact with English travellers and residents that one hears his own tongue, and is offered his familiar food. The transient life of the town is more of England than of France, but the people of Guernsey themselves retain their old traditions and language even more tenaciously than do those of the larger island. Here, as there, the hand of the general government is lightly laid. The military governor and the garrison are supported by the Crown, and no customs-duties or taxes of any sort are levied on behalf of England. The

OLD COW LANE, ST. PETER PORT.

chief local dignitary, "The Bailiff," is appointed in accordance with the local usage, and the people are governed by their own legislature.

French silver, not English, is the currency, and the French language — or rather a French language — is almost exclusively spoken by the

native population. A good idea of its peculiarities is given by the following specimen of Guernsey French, which differs materially from Jersey French: —

Il semble òsin kiçhin nou vé des ptie moutons,
Et grande bêtes a kat-pee a majár la várdure,
Tandis q'les kóc-é-dâwk, les kànár et dindons,
Suivis par leux fúmelles, et leux biaux p'tie poúâwchins,
Mange òsin leux vitâilles qui trouve par les courtis.

IN MODERN FRENCH:

Il semble aussi qu'ici on voit des petits moutons,
Des grandes bêtes à quatre pieds manger la verdure,
Tandis que la volaille, les canards, les dindons,
Suivis par leur femelles et leur beaux petits poussins,
Mangent aussi leur nourriture qu'ils trouvent parmi les champs.

The language as spoken is said to be far too complete to be called a patois, but it is an impossible jargon to the unaccustomed ear. We were told, in asking our way, to go straight on until we came to a certain house, "et pie à dé," which we learned meant, "et puis à droite." One modification of the language indicates social castes which are still maintained. If one is a common worthless sort of fellow, he is called Jean, *tout court;* if a grade better, perhaps with his own cottage and pig, and some self-respect, he is addressed as Maître Jean; a small farm, a couple of cows, and a better position generally, would entitle him to be called 'Sieur Jean Marquand; he must have a comfortable property, and be a man of good standing in his parish, to be called Mess. Marquand; and it takes official dignity, or the best social position, to entitle him to be called Monsieur Marquand. Years ago the bailiff was the only "Monsieur" in Guernsey.

The Annual Report of the Agricultural Society in Guernsey is printed in French; in Jersey, it is in English. Only the official newspaper, "Gazette de Guernsey," is printed in French. The remaining five papers are in English, which is easily accounted for by the fact that the non-resident population is English, and apparently of a superior (or at least a wealthier and more cultivated) class to the English colony in Jersey;

so at least we were told, and this difference is indicated by the finer houses and more elaborate equipages one sees in driving about the country.

Many of the country-seats are stately, and the timber in their grounds is much larger and finer than most that one sees in Jersey, the general aspect of many of the places being broader and more park-like. One of the most attractive, though not of the largest, is the residence of General Huysh. This is the most charming *bijou* of a house imaginable, rich, cosey, sunny, and home-like to the last degree. It has a beautiful conservatory leading off from one of its rooms, and the well-kept grounds, enriched with sub-tropical vegetation, are nearly enclosed with vineries. Many of the better places have a respectable look of age, and some of them have names which refer to old historic incidents. The estate of Mr. Rougier, in the interior, is called "Les Eperons," from a pair of silver spurs given to its owner by his guest, Charles II., who sought refuge in these islands in his adverse days. The spurs have passed with the title-deeds of the land, and are still shown by its proprietor.

RESIDENCE OF GENERAL HUYSH, GUERNSEY.

At the summer festival of Elizabeth College, — "The Sports," — on a high bluff overlooking the fort and the sea, we saw a very gay assemblage of fashionably dressed people, and fine carriages. The young men and boys of the college, dressed in gossamer tights, were contending in hurdle-races, flat-races, sack-races, hammer-throwing, leaping, and all manner of athletic exercises, for prizes to be given by the chief lady of Guernsey. It was a beautiful afternoon, and the scene was as gay as

youth and music and flags and bright dressing and happy faces could make it. In travelling, one always draws comparisons with home customs, and we could not help wishing that this brighter element might be added to our own more staid holiday manners.

Amid so much enchanting natural scenery, it is difficult to say that one feature is more attractive than the others; but when we take into account its difference from what we had seen elsewhere, a Guernsey "Water-Lane" certainly commands our warmest enthusiasm. The lanes of Jersey have few counterparts in Guernsey, and the country roads are much the same as one finds in many other parts of Europe, — depending for their interest on fine trees, fine country-seats, wide views, and well-kept farms; but the water-lanes are, in their very charming way, peculiar to Guernsey. There are a number of them, all of the same general character. That which we first saw starts from the Sausmarez road, and winds around into a deep valley that debouches at the shore of Moulin Huet Bay, where we passed through a simple farm-gate to a terrace overlooking a most placid green-hued cove, shut in among high storm-beaten rocks, on whose sides the smoky sunlight lay warm, and whose crests were enriched with the soft tints of varied lichen. Beyond, the gleaming blue sea stretched far away into the warm southern haze, and was blended with the dreamy sky.

The lane itself is the bed of a little rill, cut deep in the earth and rock, and laid with a rough stone foot-path, at the side of which the water trickles and babbles in a small clear stream. The banks are higher than one's head, and are rich with a wealth of tangled ferns, conspicuous among which the long lance-shaped leaf of the hart's-tongue hangs in massive clusters of shining emerald green. The trunks of trees — some falling to decay, some young and fresh, and all clad with closely clinging ivy — stand out irregularly from the sides of the gorge, and shroud the passage in perpetual shade. The evidence of man's interference is very slight; Nature has had almost uninterrupted sway, and

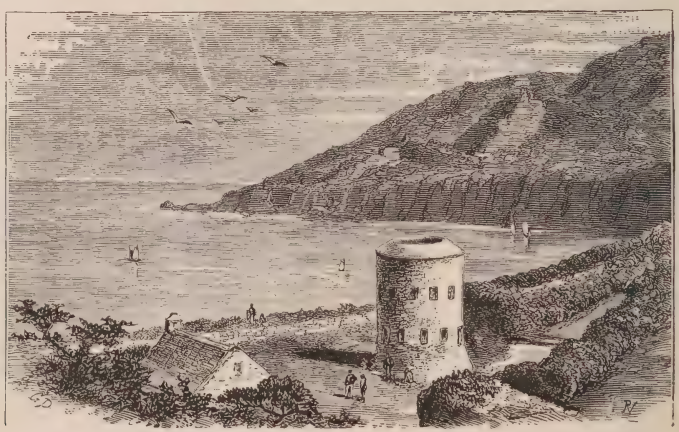
HART'S-TONGUE FERN.

has given her best efforts of genial air and fertile, humid soil to the perfect embellishment of this seaside foot-path, within sound of the ceaseless waves, but tranquil in its verdant recesses as though in the heart of a continent.

WATER-LANE AT THE COUTURE, GUERNSEY.

Another water-lane at the Couture, near the town, is more of a thoroughfare, and is more open to the sunlight, but it is a charming walk, none the less.

On the east coast, a mile south of the town, is Fermain Bay, backed and enclosed by fine cliffs, and protected (in the olden time) by a Martello tower, of which there are many about the shores of the island. The access to this is by a road called Fermain Lane, which leads down a charming half-cultivated valley, and past small cottages and picturesque houses.

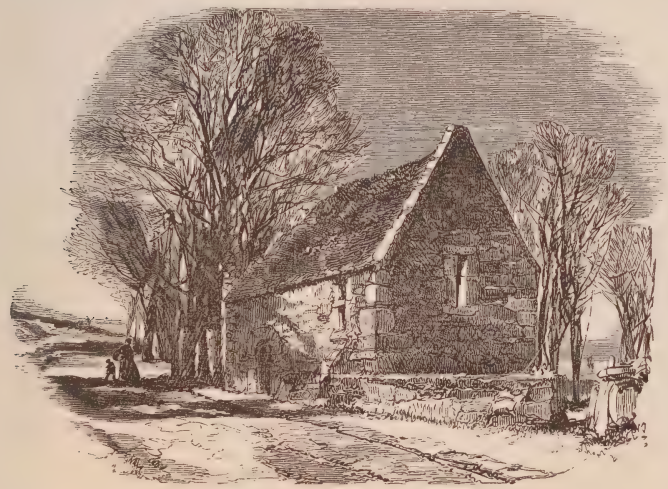


FERMAIN BAY AND MARTELLO TOWER, GUERNSEY.

The drives in the interior are not uninteresting, but they are in no way comparable (for rural charm) with those of Jersey. The surface of much of the island is but slightly undulating, and the northern and western parts are but little elevated above the sea. The farm-houses and cottages, often covered with thatch, are picturesque, and have the charm that the luxuriant and unusual vegetation of the Channel Islands never fails to lend. Many of these houses have the characteristic round-arched stone doorway still as firm and sound as when they were built, centuries ago. This round arch, so common here, is very rare in Jersey.

A COTTAGE DOORWAY, GUERNSEY.

Of the same period and style is the chapel of St. Apolline, the oldest ecclesiastical building in Guernsey. It is of rude stone-work laid in mortar made with limpet shells, and is only twenty-seven feet long by thirteen feet broad.



CHAPEL OF ST. APOLLINE, GUERNSEY.

Near the shore north of the harbor of St. Sampson's is Vale Castle,

GATE-WAY TO VALE CASTLE, GUERNSEY.

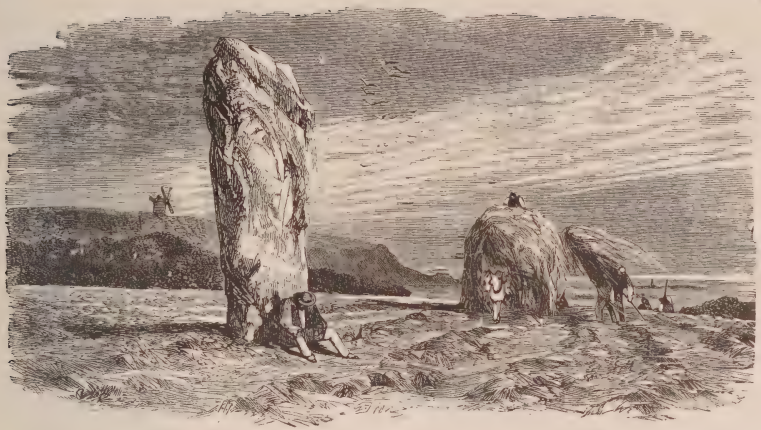
VALE CHURCH PORCH, GUERNSEY.

whose restored ruins are now used as a barrack. In the same parish, on the road to L'Ancresse Common, stands the Vale Church, whose porch is curious, and quite different from anything else in the islands. About a mile north of this church is the most important Druid altar or cromlech of Guernsey, the interior of which, a spacious chamber, is here illustrated; another, similar to this, called the Pierre Dehus, lies near the extreme northeastern point of the island.

INTERIOR OF A GUERNSEY CROMLECH.

There are other Druidical (or Celtic) remains of importance; one very curious one is a tall monolith near Rocquaine Bay.

We were so fortunate as to be admitted to the private museum of the late Mr. F. Lukis, at St. Peter Port, where there are many archæological and other curiosities, and among them objects taken from the cromlechs of the Channel Islands. The group of ancient pottery shown herewith was taken from cromlechs in Guernsey, the four central pieces from that on L'Ancresse Common and from the Pierre Dehus. This pottery was unburnt, and is like no samples of Roman workmanship. There were



A DRUIDICAL MENHIR, GUERNSEY.

also found many ancient stone weapons, of which there are excellent specimens in the Lukis Collection. In the excavations which led to the discovery of these remains, they were found in different layers, those of the older and ruder forms lying the lowest. With the lower layer, upon the stone floor, and placed with evident care, were bones of men, women,

ANCIENT POTTERY FOUND IN THE ISLANDS.
(Lukis Collection.)

and children; many of these are still in excellent condition, and the skulls of the adults are set with teeth to make the suffering mortals of to-day long for the diet from which such painless molars were grown.

The visitor to Guernsey should not fail to ask permission to see this museum, which is in the basement of a private house. It contains much

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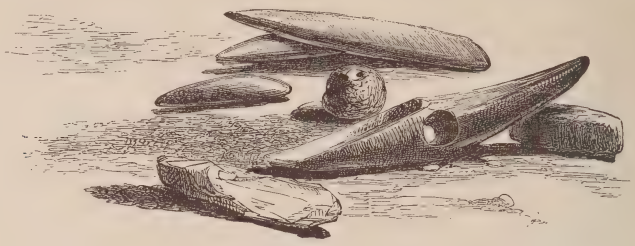
of inestimable value, not only from the islands themselves, but from other curious corners of the world; and by no means the least interesting thing



ANCIENT IMPLEMENTS FOUND IN THE ISLANDS.
(Lukis Collection.)

about it is its evidence of what may be accomplished by a private gentleman, of no great fortune, applying himself to the pleasant work of archæological research and collection.

In St. Peter Port there is another house, much more widely known, and with a very different interest. Its broad, high, tame-looking front stands near a narrow street, and impresses one with the homesick air of a Puritan boarding-school. Within, it is a perfect bric-à-brac shop of old carved furniture, old tapestry, old India shawls, old Turkey rugs, curious old pottery, old Dutch tiles, objects of art and objects of historic or literary interest; among others, the pens with which Hugo wrote "Les Misérables"; Dumas, "Monte Christo"; Lamartine, "Les Confidences"; and George Sand, "Consuelo."

In the drawing-room, the candelabra are held by the identical gilded figures which ornamented the Bucentoro, the barge in which the old Doges of Venice went out to wed the Adriatic. The dining-room is decorated with blue Delft ware and Dutch tiles, the latter forming a curious chimney-piece. The house is crammed from top to bottom with curiosities of all sorts, which must make it more satisfactory to show to visitors than to live in. In the east roof is built a very eyry of a writing-room, — shut out from the world, and commanding miles of rugged rock and storied sea, — where "Les Travailleurs de la Mer" was written, in full view of its foamy toils, — for this is Hauteville House, the cherished home of Victor Hugo, who, unfortunately, was absent at the time of our visit.

DRAWING-ROOM OF HAUTEVILLE HOUSE, GUERNSEY.

The manners and customs of the people of Guernsey, like those of Jersey, have been (so far as they are obvious to the casual visitor) much modified by frequent contact with English and French visitors during the past quarter of a century. "Still," says Ansted, "no one can go into the cottages and mix much with the people without observing some characteristic points. Each cottage has in the kitchen, or principal sitting-room, a wooden frame spread with dried fern, on which the inhabitants

PORCH OF ST. MARTIN'S CHURCH, GUERNSEY.

repose in the evening. This custom is, no doubt, French, and very old. It is connected with all the habits and traditions of the people, and comes into use on such occasions as the vraic harvest, and on all festivals. The older people, more especially, resort to it, and, though rough, it is by no means an unsightly piece of furniture. It corresponds with the chimney-corner in an old English farm-house, where wood is still burned, and where pit coal is an unheard-of novelty."

Our stay in Guernsey was so short that I could gather only a general impression of its agriculture; barely sufficient for an intelligent understanding of Mr. Le Cornu's excellent account of it in his prize essay on the agriculture of the Channel Islands, published in the "Journal of the Royal Agricultural Society of England," in 1860 (Vol. XX. Part I.), from which much of the following is condensed. He thinks that, although in many parts the soil is very deep and rich, it is less so than that of Jersey. The tenure of property is much the same as that of the larger island, but the subdivision is greater. The privileges of eldership are less. The eldest son can claim less than one sixth of an acre with the house. It is true that he has the right to buy, on the appraisal of the parish authorities, all the remaining land to which he can have access without crossing a public road, but the appraisal is so high that he generally waives his claim. The farms are even smaller than in Jersey, and the average size is at least one fourth less. None exceed forty acres.

On a farm of seventeen acres, which is a good-sized holding for Guernsey, the usual distribution of crops would be: —

	Acres.		Acres.
Hay and Grass	$9\frac{1}{2}$	Potatoes	$\frac{1}{4}$
Turnips	$\frac{3}{4}$	Mangolds	$\frac{3}{4}$
Parsnips	1	Wheat	$2\frac{1}{2}$
Carrots	$\frac{1}{2}$	Oats and Barley	1
Gardens, etc.	$\frac{3}{4}$ acre.		

On such a farm the stock may consist of four cows, six heifers, two horses, one ox, and half a dozen pigs. Oxen are much used.

The great trench plough is used in preparing land for parsnips, as in

Jersey, and vraic (sea-weed) is largely used as manure. Much of this is taken on the shores of the island itself, and much is brought from Herm, whose rocks are peculiarly fertile in this direction.

The fields are not more than one acre and a half in average size. "They are divided by large embankments of earth, on the top of which furze is seen growing luxuriantly; this furze is used by the country people for heating the oven for baking. At the field entrance you will rarely see gates except on property belonging to the higher class. Very many field entrances are to be seen with only a bar placed across to prevent cattle from entering. The dwelling-houses are, in general, patterns of cleanliness. The exterior, in particular, presents a striking example of taste; flowers and creepers invariably adorn the walls, the wood-work appears as if it had been lately painted, and the *ensemble* is strikingly neat and pretty."

The arrangement of farm-buildings is very much the same as in Jersey, the cider-press being less frequent, as there are fewer orchards.

In the dairy very important changes are noted. The same narrow-mouthed milking-can is used, but the cloth and shell which in Jersey are universal, are here unknown, and the method seemed to strike some farmers to whom I mentioned it as a curious novelty. There is, too, an absence of tidiness (according to our ideas) in the processes of the milk-room, which was a curious novelty to us. The milk is poured into tall earthen-ware jars, — like the oil-jars of Ali Baba, — set in a cool place, and there it stands, untouched, until churning-day. In the principal dairy that we visited, the cream on the older milkings was much wrinkled and cracked, and the older jars were covered with blue mould. The dairymaid, who seemed quite proud of her butter, — and well she might be, — made light of this, and said it was nothing unusual, though she did not like to see it quite so far gone.

The churning is done once or twice a week, in an enormous vessel of curious cooperage, — a broad-based monster of iron-bound staves which retains its size for a considerable height, and then narrows rapidly to the dimensions of an ordinary churn. Speaking from recollection, I should say that some churns we saw would hold sixty gallons. The dasher is quite the same as the old-fashioned sort in use with us, and not larger.

The entire contents of the jars are poured into the churn, — loppered milk, cream, wrinkles, mould, and all, — there to be beaten with the dasher for hours and hours. The churning takes never less than two and a half hours, and generally nearly twice as long, — sometimes nearly the whole day. I could account for the undeniably good quality of the butter resulting from this process, only on the supposition that such long working in the buttermilk removes the taint one would expect to have attacked the cream during its long standing on sour milk, and under more or less mould. Guernsey farmers maintain that only by this process can they get all the butter from the milk; one would think that a slight loss in this respect would be preferable to the expenditure of so much labor. Whether the milk of Guernsey cows, fed on the grasses of their native pastures, would make better butter if only the cream were churned, we could not learn, being told that the process was nowhere employed.

Churning the whole milk is universal in Guernsey, yet the custom has never crossed the narrow strip of sea and found a place in Jersey. Verily, the people of these islands are tenacious of their old traditions, and one may here say, of their old cows.

The Guernsey cow is as different from the Jersey as is the Devon from the Ayrshire, or the Shorthorn from the Dutch, and (without the operation of legal prevention, which keeps "foreign" cattle from being brought to either island) the races are kept distinct. No one would use a Jersey bull in Guernsey, or a Guernsey bull in Jersey; the cows which are now and then transplanted are regarded as intruders of an inferior order, and their progeny is excluded from competition at the cattle-shows. There can, however, be little doubt that less care was formerly used in this respect, for there are to be detected, among the herds of both islands, traces of an old blending of bloods, which has apparently done no harm in either case. The races are now quite distinct, and their improvement, in both islands (which is constant and considerable), is strictly within the lines of pure breeding. Whether the distinction arises from a different origin, or from ages of breeding to a different standard, cannot be determined.

The Guernsey cows are considerably larger than the Jerseys, of coarser structure, and greatly inferior in beauty of appearance; they have, however, many qualities which must commend them to the favor of butter-makers. They are rich and large milkers, and the color of their skin and of the butter they produce is decidedly deeper and richer than that of the sister race. The prevailing color is a rich fawn with much white, — usually laid on in broad patches. The muzzle is buff, and the eyelids are almost yellow. The horns are usually amber-colored, and under the white hair, wherever it appears, the skin is of a bright orange, that is only exceeded by the golden yellow of the inside of the ear.

The cows, when they dry off, fatten very easily, and, being larger, make heavier beef than those of the sister island. The oxen, when taken from their work, feed remarkably well; the four prize oxen of 1872 turned out an average of 1,144 pounds of butcher's meat, — the average age being between six and seven years. This quality is surely an important one, yet it may easily be overestimated. One of the last things a farmer should consider in deciding on a cow for butter-making, where his profit depends on her product while living, should be the amount of meat he can make from her when dead. A very slight difference in the average daily produce during eight or ten years would make up for a very wide variation in value for the shambles.

Were the Guernsey cattle comparable in appearance with those of Jersey, it is not unlikely that they would have superseded them in popular favor. While the Guernseys are perhaps a shade more promising for the butter-dairy, the Jerseys are close upon their heels, and are so much more taking to the eye that any slight difference in butter and beef would be more than compensated by the more salable character of their calves, even in the eyes of one's farmer neighbors. Which of the two will produce the larger amount of butter from a given amount of food, is an unsettled question. The champions of each island claim superiority for their own race, and both have statistics to support their opinions.

Mr. Le Cornu says: "It is an open question whether the cows of Jersey or of Guernsey are the best. The Guernsey cattle are the largest of the Channel Islands breed; but for symmetry, the palm is awarded

to those of Jersey. The former does not vary so much in color as the latter, but it is usually red and white. . . . . It is the custom here also to tether cattle when out. . . . . The produce may also be said to average the same, for, although the greatest rivalry on this point exists between the farmers of both islands, on investigation it will be found that the accounts of produce correspond. The fattening of oxen is carried on here to a certain extent, and it may be computed that one sixth of the supply (of meat) is fed on the island. One of the great properties of the breed is that it will fatten rapidly, and produce meat of excellent quality."

Mr. F. Carey, of Woodlands, gives an account of the management of his own dairy which is so remarkable, and at the same time so complete a description of the intensive character of Channel Island farming, that it seems worth while to copy it entire. "Since 1845 I have constantly had five cows at Woodlands, renewing them when requisite, — seldom, and only on account of age. The land appropriated to their keep is about eight English acres of grass, one fourth acre of clover, and one half acre of vetches. From the grass land, however, I make from twenty to twenty-five tons of hay, extra, according to season; they having the after-grass, and a bite from about two acres of the above in February and March, dressed early to admit of their doing so ere being mowed, and the clover and vetches. For their winter food, they have the produce of about one acre of yellow mangold, long and globe, and of half an acre of long white or purple turnips. My cows have no swedes, having discontinued the cultivation, which has failed these last three or four years, scarcely giving one third the weight of mangold, which is besides more nutritious. They are fed as follows, and milked three times a day: —

6 A. M., a little hay, previous to milking.
7 " a basket containing about 28 lbs. (English) mangold and turnips in equal proportions, or only the former when out of the latter.
8 " hay.
10 " mangold and turnips as before.
11 " hay, after milking.
1 P. M., hay, after being watered.
3 " mangold and turnips as before.

4 P. M., hay.

6 " mangold, etc., after milking.

8 " hay, rather more than above, being for the night.

"The several feeds of hay may comprise about twenty-three pounds English, and mangold, etc., one hundred and twelve pounds; this is attended to (milking excepted) by a lad of fourteen, and among his other occupations. Weather permitting, and grass offering, however scanty, they are led out at midday and tethered for three or four hours, which refreshes them greatly; in which case a feed of hay and another of mangold *less* is given to them. These roots go through a turnip-cutter, sliced an inch thick, the diameter according to the size of the root.

"In April or May, they begin with the clover, tethered of course as usual, and changed six times a day, watered twice, and sleep out; their tether (12 feet long) is moved from one to two feet, according to crop, of which they have three or four bites according to and during the season. The vetches are eaten in June, and are about the month's consumption, if very fine. In case of threatening weather, wind particularly, they are removed for the night against the hedge for shelter.

"My cows are usually dry about one month before calving; otherwise, their food is reduced to make them so, — they are led to bull about three months after calving. On dropping, their calf if a heifer, which is always taken to the nursery, has the mother's milk for eight days only, then skimmed and given for a week longer; therefore milk is quickly brought into use as regards the dairy. If a bull calf, it is either fattened, also apart, with the mother's milk from four to five weeks, or sold immediately after birth, according to circumstances.

"The cows immediately after calving are offered the first milk, which some refuse, others drink; in either case a small sheaf of barley is given them, which they always eat with avidity, — it accelerates the after-birth. They are sparingly fed for eight or ten days, during which, from the third day, a few Belgian carrots sliced and steeped in hot water, but allowed to cool a little, are given to them, increasing the quantity daily, for a week or ten days longer, — hay, of course, being their principal diet, — and then their usual food as already stated, giving

a preference to the white or purple turnip, which is not as cold as mangold. For their drink, they have two or three times a day, for the three or four first days, about two quarts of bran thrown into a bucket of tepid water, which is replenished by the dairy-maid holding in her hand a canful of similar water, of which the cow drinks at her pleasure. The same quantity of oatmeal is then given them for eight or ten days longer, and beyond, according to weather: this is in reference to *winter;* for in spring and autumn we had them out to grass two or three days after calving, tethering them in a sheltered and shaded spot for a similar period, giving them the already stated drink, but for seven or eight days only. I however allow those calving in the *former season* to go out a fortnight after, provided the weather is very fine and comparatively warm, the first two or three days, for about half an hour only, lengthening the time progressively, but always depending on the weather. My cows calve in January, April, August, October, and December, accordingly avoiding the hot months, during which the animal is subject to milk-fever, fatal in this island. In very warm weather they are tethered in the shade from eleven to three o'clock, when a feed of clover or vetch is given to them.

"The greatest cleanliness is observed in every department of the dairy, so essential in the manufacture of so delicate an article as butter."

Mr. F. F. Dally, of Guernsey, author of an Essay on the Agriculture of these islands, which was only second to Mr. Le Cornu's, gives much more detailed information about the farming and general characteristics of Guernsey than is to be found in the prize Essay. Dally is especially clear in matters relating to the cattle and the dairy of this island, — which are in the eye of the farmer its most interesting characteristics.

There is no other feature of the agriculture of Guernsey to claim especial attention in a short notice, but its horticulture is as suggestive of genial climate as that of Jersey. The same tropical vegetation, the same luxuriance of growth and bloom, greet us at every turn. Figs and oranges ripen in the open air. The aloe is a common lawn plant; hedges are made of fuchsia and camellia; the geranium is a hardy shrub, and the fuchsia overhangs the second-story windows of the low farm-cottages, fringing their mossy thatch with a drapery of crimson pendants.

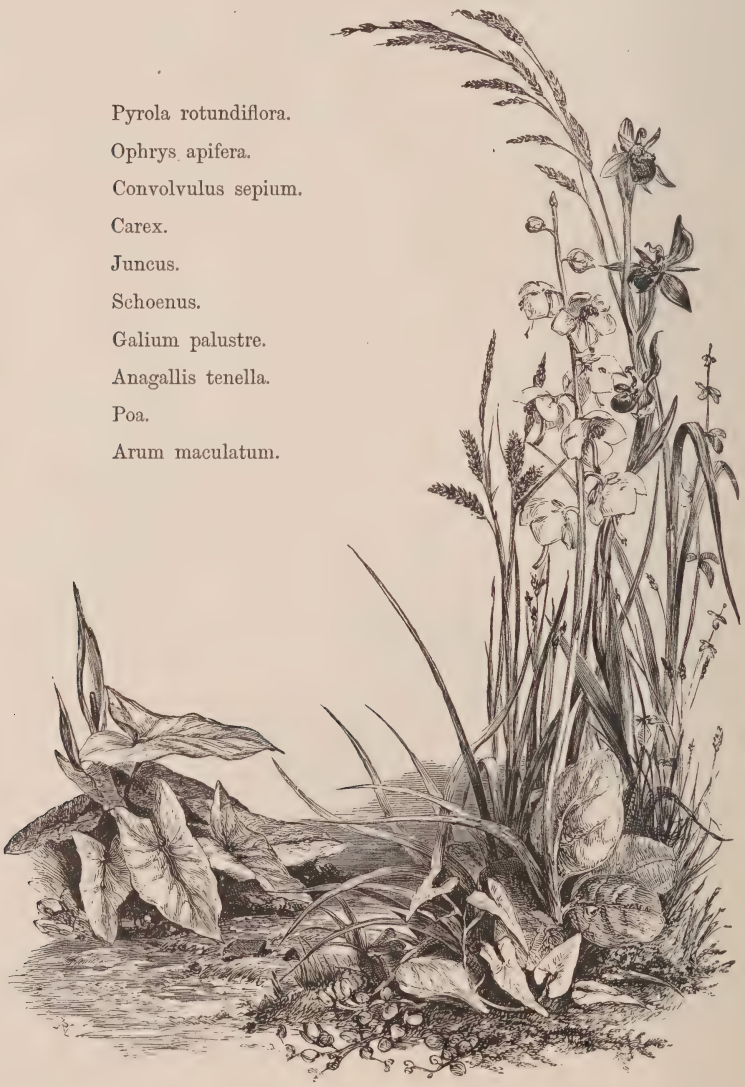
The scented magnolia forms a sturdy tree; the araucaria thrives, the arbutus attains a height often of thirty feet and its berries ripen; the myrtle grows to a good size and flowers freely. The rhododendron flowers abundantly from December until June. The lemon verbena assumes the proportions of a tree, with long, drooping branches.

The beautiful Guernsey lily flowers regularly in the Channel Islands, while in England it can rarely be made to bloom the second time. The more beautiful belladonna grows to really marvellous perfection, and is found everywhere. Even the smallest cottages have their front gardens stocked with flowers, and one may buy in the market for a few pence bouquets which, if better arranged, would command a high price at Covent Garden.

The country people of Guernsey are industrious and thrifty. Even the laboring class make it a point to accumulate enough money to build a home on the shred of the patrimonial estate that has fallen to their lot. "There are, perhaps, no people who rise earlier, or retire to rest later, than the native farmers of the Channel Islands. It is not uncommon to hear of their being at work in the morning before four o'clock, and yet seldom is it that they take their rest before ten at night." The question arises whether it must not be an exceptionally unexhausting climate where so little sleep is needed, and where men maintain almost youthful vigor to a very great age.

We went, one afternoon, down into a beautiful narrow valley, — a cleft of verdure opening out toward the sea, — to look at the prize cow of the year. The owner, who lacked only three months of eighty, showed the ladies and our friends an easier way around, and led us down a difficult, steep path that ended with a jump of some feet. The cow (which was probably the best cow, all in all, that we ever saw, and which had the head and the form of a Jersey, with the rich coloring of her own race) was young and sportive. The old gentleman had his hat knocked off in the struggle, and was nearly thrown, but he finally caught her nostrils and held her fast. I proposed that we should return by the longer way, but he scouted the idea, saying he was the youngest man in the party if he had lived the longest, and he went back like a

boy, by the way we had come. I should be glad to compromise on such physical and mental vigor for my sixtieth year. At his snug stone house he took great delight in showing us a gold medal awarded him at the Paris Exposition for the best Guernsey cow exhibited there.



SOME GUERNSEY PLANTS.

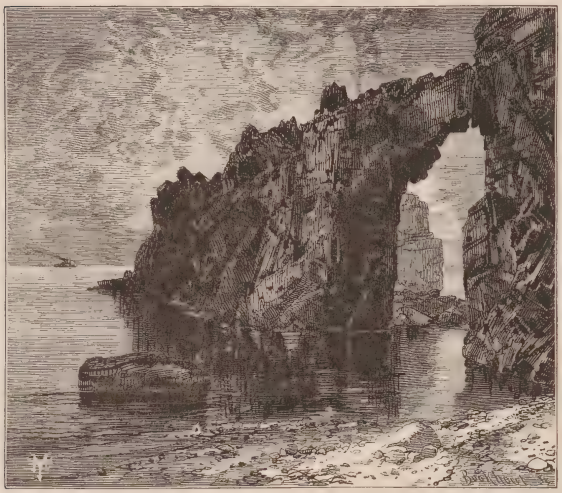
CHAPTER VII.

SARK.

WITH all its advantages, the best thing about Guernsey, so far as the tourist is concerned, is its nearness to Sark. The morning after our arrival "Boots" appeared. "Please, sir, would you like to go to Sark? It is a fine day, and Purdy is below, sir." Of course we would, and we were soon booked for the little sail-boat which makes irregular excursions, rather than to take the chances of the weather for the small steamer of the next day. He who goes to Sark, if he is wise, leaves no positive engagements behind him. The trip has all the excitement of uncertainty as to its duration. When Dana, the artist, went over to pass the day, he was gone for a whole week. Sky, tide, and rock are all treacherous, and even old fishermen who have passed their lives in the perilous navigation of these waters make no calculation of the length of their trip. We were a party of seven, in a stout open boat, with little rags of sails stretched from the movable masts; Purdy at the helm, and his two boys half asleep on the spray deck near the bows. It was a beautiful day, with only a rippling breeze to move us slowly out of the harbor, under the gray walls of Castle Cornet, across the swelling open sea, and into the narrow passage between the outlying rocks of Jethou and Herm, — wild, storm-beaten rocks, hung with yellowish-green sea-weed, the ceaseless spray breaking at their feet. Drowsy cormorants and snow-white gulls stood motionless upon them, basking in the warm sun, or swept slowly about in the very idleness of motion. On Jethou, near its only house, long unused, a few goats stopped nibbling the grass to watch us. They were Purdy's flock, and they alone represent the agriculture of Jethou. Across the narrow channel the tidy-

looking island of Herm lay, sloping its green fields to the sea, and stretching away its dismal coast, among the wild rocks, toward the west and north.

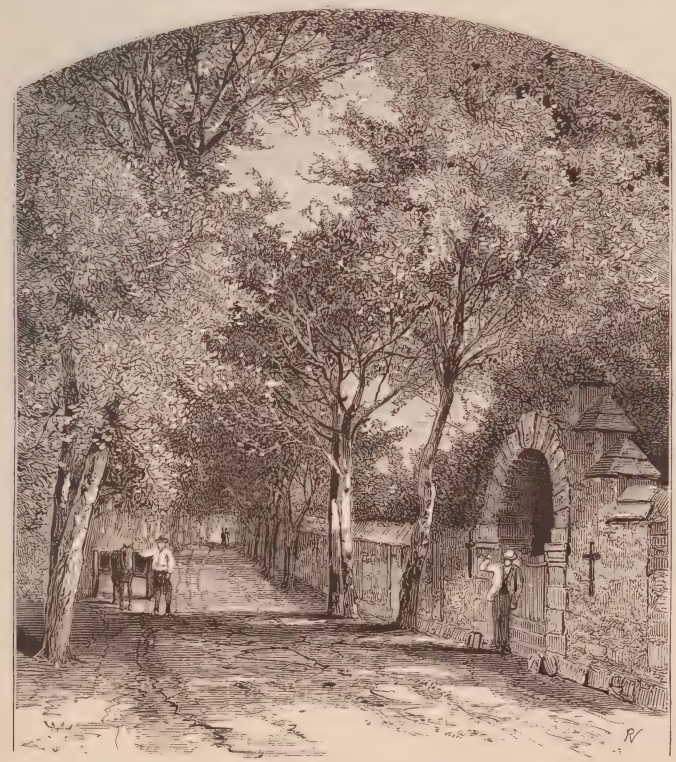
It took some time for us to run through this rocky passage, where conflicting currents and unexpected eddies elevate navigation to the rank of a fine art. As Purdy expressed it, in some places the tides are regular, and in others "it flows till half ebb and ebbs till half flood. It takes a lifetime to understand 'em, and then you don't."



ROCKS ON THE WEST COAST OF SARK.

The day being fine and the sea quiet, we were bound for L'Epercherie Harbor, at the north end of Sark, — Sark, of which we had heard so much, which had seemed, as seen through the haze from Guernsey, such a dream of a high-lying blue fairy-land, and which now stood in its stern majesty high and wild above the glassy water. The little wind there had been had died quite away, and the boys had to be awakened to take a pull at the sweeps, rowing incessantly for nearly two hours before we reached the harbor. And what a harbor! A little open bay flanked by rugged cliffs and set about with rocks, many of them half submerged and foaming with an angry swash, as the swell of the sea broke over their weed-grown crests. Below, through the clear water, the deep-lying bowlders told the tale of the devastation that had been wrought on the granite cliffs by the fearful north-wind seas. Small though our boat was, there was not even a friendly rock against which she could lie, and we had to be transferred to a very tub of a heavy surf-boat, which was rowed near the shore, and then hauled up, by men wading leg-deep, on the beach of rolling paving-stone.

Once landed, we found only a barely practicable foot-path leading, zig-zag, up the steep cliff. After we had toiled to the top, we could have tossed a stone into the little boat which lay on the beach nearly three hundred feet below us. A small scion of the great house of the De Carterets served as guide, and showed us our way over barren pastures and past neglected fields into the embowered road that leads past the arched entrance to the Seigneurie, through which we had our first glimpse of the beautiful grounds of the Lord of the Manor, whose picturesque buildings — parts very old, and all well kept and in good taste — are well suited to their charming setting. This place is worthy of careful study as a capital example of gardening in the natural style, where most judicious use has been made of the ample materials this genial climate allows to be employed.



ENTRANCE TO SEIGNEURIE.

From the Seigneurie we walked on past the very plain and unattractive church and turned into the fields, taking a foot-path that led down a wooded valley, and coming soon upon an old stone fountain at which a young girl was filling her pail. This fountain was shaded by high trees and thick-growing shrubs, and from it ran a trickling stream that follows the course of D'Ixcart Valley to the edge of the eastern cliffs. Crossing a little foot-bridge, we ascended the southern slope and came out in the grounds of the D'Ixcart Hotel, situated quite in the interior of the island, sheltered by hills and trees from every wind, and surrounded by the most home-like yards and offices. While we fortified ourselves with a hasty luncheon, our little guide went to engage a carriage for us, and we wandered slowly toward the high-road to meet it. Our path lay through a lane that is hardly excelled by any in Jersey, and which has the attraction of being almost the only one of its kind in Sark. About a quarter of a mile from the hotel this lane joins the main road running north and south through the island, crossing the "Coupée" which connects its two unequal parts. We drove to the Coupée, but old Mr. Guille, who owned this only "carriage to let" in Sark (an open two-seated phaeton), declined to drive across, saying that he had driven over, but he never did so except in case of absolute necessity. We were very far from urging this as a case of necessity, and when we were fairly upon the Coupée we were glad enough to be safely on our own feet, for the road, which had only recently been elevated from the condition of a foot-path, was barely wide enough for a single narrow vehicle, and at both sides the rock descended almost vertically to the little bays nearly three hundred feet below.

AN OLD FOUNTAIN IN A SARK VALLEY.

The distance across is about two hundred yards, and the passage is guarded by no parapet of any sort, — not even a hand-rail, — save at two places where a harder rock has better resisted the action of the

rains, and where the road has been cut through. With all its improvement, the Coupée is but a rugged path along the crest of a narrow vertical ledge, from whose giddy height it requires a steady nerve to look down over the steep granite walls that support it, and one naturally seeks a safer point from which to examine the ponderous cliffs that surround the adjoining bays. High though it is, it is much lower than the mainland of Great Sark and Little Sark, which have no other means of communication, and which, as seen from it, — or from the sea at any point, — look like majestic rocks topped with treeless fields.

THE COUPÉE, SARK.

The habitations of Sark are built mainly in sheltered nooks and valleys, where they are protected from the frequent fierce winds. In these hollows, too, vegetation is luxuriant almost to rankness, and the impression gained by even a hurried examination like ours is of a great wealth of vegetable life and of the charm that this alone can lend; and this amid surroundings of such grandeur as makes Sark one of the wonders of the natural world.

Mr. Guille must be a model "cocher" to those who understand — if any one but born to it can understand — the barbarous language of this island. Though a loyal Briton, he preferred to speak French, but he had some original conceptions of that tongue. The information we gained from him was extremely meagre; in statistics and sociology it was confined to the facts that the population of the island is less than six hundred souls, and that of these over ten per cent are confirmed

drunkards. Fortunately, the student of the Channel Islands has good help in the few books that have been written about them, and we found it chiefly important to be guided to the different points we indicated; and, after all, it was a real advantage to escape the routine gabble of the professional cicerone.

From the Coupée we went to the Creux du Derrible on the eastern shore. This is a deep vertical shaft, about fifty feet in diameter, descending from the high table-land — or from the side of a high hill, for one side of the opening is much lower than the other — to a yawning cavern into which the sea rises at every tide by two large entrances, wave following wave, with a roar that comes up in deafening reverberations through the fearful Creux. It is possible at low tide for a good cliff-man to climb down the face of the steep shore, by the aid of iron rings fastened to the rock, and to enter the cavern from below. Here the blue sky is seen above as from the bottom of a well, while through one of the entrances are seen the bright, clean-cut rocks of the Point du Derrible, and through the other the distant coast of Jersey.

THE SEAPORT OF SARK.

Returning to our vehicle we drove around by the road to the seaport of Sark, — Creux Harbor. This is the only landing-place on the island that is at all worthy of the name. The few valleys terminate in steep cliffs, up which it is impossible to climb. L'Epercherie is accessible only in calm weather, and is always difficult. Le Havre Gosselin, and the Port-és-Sees, are practicable only for the chamois-like fisher-

THE GOULIOT ROCK FROM THE HAVRE GOSSELIN, SARK.

men of Sark. Creux Harbor is a curiosity in itself, — a little cove shut in by a breakwater that leaves passage-way only for small boats, and within which these are secure only when hauled high above the reach

CREUX HARBOR, LOOKING OUTWARD.

of the tides and made fast with ropes and chains. On the land side there is only a rough beach of cobble-stones and bold rocks of enormous height, through one of which an artificial tunnel leads to the only road by which vehicles may reach the shore. Passengers and goods arriving must be transferred to small boats and landed inside the breakwater, and then be hauled up the steep picturesque valley, — a valley charming with superb seaward views, and well sheltered and shaded stone houses.

TUNNEL ENTRANCE TO CREUX HARBOR.

We now returned to the hotel to see what Sark, in its isolation, could do for us in the way of dinner, hoping at least to appease the hunger our clambering had aroused. Why will not some benefactor of his country send a ship-load of American hotel-keepers to difficult Sark to learn from Mr. Gavey the important art of public hospitality? Our repast was not sumptuous, but it was more than sufficient, and with ample variety. The cooking and the service, while they were simple, and such as might be easily compassed in any of our villages, were tasteful, cleanly, and thoroughly excellent. A dozen guests would crowd the house; but our own caravansaries, made to accommodate hundreds, are barbaric feeding-shops compared with this home-like little inn, which, once known, remains in the traveller's mind as a perpetual invitation to return to the green valley in which it nestles. We left it with real regret, and if we are fortunate we shall some day return to it with delight. There is another hotel which is well spoken of, and comfortable lodgings are to be had in private houses.

Sark offers many advantages to those who wish to spend some time in quiet retirement. The climate is perfect, better, if possible, than that of the other islands, and it is said that the inhabitants of Guernsey resort

to it for the benefit of its more bracing air. It is, however, the student of nature who will get the greatest satisfaction from a sojourn in Sark.

The botany of the island is quite similar to that of Guernsey. There is little cultivation of foreign plants, except in the grounds of the Seigneurie; but here there are very good examples of successful adaptation, and in every damp valley the native ferns grow in great variety and with remarkable luxuriance.

THE BURONS, SARK.

The magnificent cliffs on every side of the island are pierced with huge caverns, where the sea has worn its way into the softer veins, and the shore is piled with masses of fallen rock, and bowlders undermined or torn away by the waves. All is wild and weather-beaten, and one sees at every point combinations of nature's boldest rock-work, not less grand than those shown in the illustrations given herewith.

Ansted says: "One must visit Sark to see what water can do with granite. In walking through the remarkable cavern called the Boutiques, natural fissures are traversed more than a quarter of a mile long, not crossing the island, but parallel to its length, opening from one, intersected by two others, and terminated by a fourth grand chasm. The floor of this cleft is a wild chaos of rocks, some fallen from above, some

rolled in from the sea. The roof, some fifty feet overhead, is always falling, and becoming converted into rocks and pebbles; the floor, composed as it is of Titanic angular fragments, is rapidly removed, and as frequently replaced. The extremity is choked at one time by stones that even the old Druids would hardly have attempted to move; at other times it is open to the sea, all these being swept away."

The destructive action of the waves is constant. In all the little bays with which Sark is surrounded, and which can be approached only in boats, and in calm weather, the falling of the cliffs at all seasons is sufficient to compel caution in visiting them. Wherever cultivation has been carried too close to the cliffs, fields and fences fall into the sea, and in this way the land is slowly becoming narrowed. The sea is so deep, close to the shore, that there is little accumulation of *débris* at the foot of the cliffs, — all is rolled into the water, and buried forever out of sight.

When it is remembered that the table-lands of both Great and Little Sark are three hundred and fifty feet above mean-tide (the highest parts even more than this), that the tide rises thirty or forty feet, and that its rush is aggravated by frequent storms, which lash it to fury, it will be seen that this remarkable island, with its outlying rocks, offers greater advantages than any other point in the range of ordinary travel for studying the destructive action of the sea.

The adjoining island of Brechou, which is about three quarters of a mile long, is less high than Sark, but it has the same rough, bold coast, pierced with caverns, and the same angular cliffs.*

The great attraction of Sark to the naturalist is to be found in the marine life of its frequent caverns. This is said not to be equalled in Europe, — not even by that of the celebrated caves of St. Catherine's Island, near Tenby. The zoöphytes exist in singular multitude and variety. To seek these requires the most vigorous and the most invigorating cliff-work, and the stimulating element of danger is rarely absent.

Ansted says on this branch of his subject: "The great range of tide,

* Brechou has two farms, and is inhabited, according to the last census, by seven human beings, one horse, one cow, one dog, and several sheep.

the complicated character and gloom of these vast natural vaults, whose deeper recesses are not accessible more than a few hours in the year, are among the causes of this wealth. They may, with truth, be regarded as the *Grüne Gewölbe* of the Channel Islands. They are treasure-houses, where, instead of the accumulated stores of mediæval art, such as are lavishly spread out in the chambers so named in Dresden, we find all that is brightest and richest and most varied of nature's work. There is, however, one curious difference. The beauty of form is here confined to animals, whose structure is of the simplest kind, and all we see of life is in a form that involves the smallest possible expenditure of other substance than sea-water. . . . . The largest and heaviest individuals, even if carefully preserved, scarcely yield more than a few fractions of a grain of residuum, and with all the colors of the rainbow, and varied forms imitating trees and flowers, there is no more substance in them than in a soap-bubble."

Taken all in all, Sark and its surroundings combine more of out-of-door attaction, especially for a vigorous and studious tourist, than any other spot of equal size of which I have knowledge. A literary man seeking retirement would find it as well suited to his wants as a light-house; and the artist would find here such marvels of marine grandeur as, if faithfully portrayed, would bring him the reputation of a genius.

Of the early history of Sark not much is known. Unlike the other islands, it was long held by the French, who took it in the reign of Edward IV. It was recaptured during the reign of Queen Mary by the aid of the friendly Flemings. The following account of the recapture, given by Sir Walter Raleigh (sometime governor of Jersey), is copied from Falle's history: "The Island of Sark was surprised by the French and could never have been recovered again by strong hand, having Cattle and Corn enough upon the place to feed so many Men as will serve to defend it, and being every way so inaccessible that it might be held against the Great Turk. Yet by the industry of a Gentleman of the Netherlands, it was in this sort regained. He anchored in the Road

with one Ship, and pretending the Death of his Merchant, besought the French that they might bury their Merchant in hallowed ground, and in the Chappel of that Isle; offering a Present to the French of such commodities as they had aboard. Whereto (with condition that they should not come ashore with any weapon, no not so much as with a knife) the French yielded. Then did the Flemings put a Coffin into their Boat, not filled with a dead carcass, but with Swords, Targets, and Harquebuzes. The French received them at their Landing, and searching every one of them so narrowly as they could not hide a Penknife, gave them leave to draw their Coffin up the rocks with great difficulty. Some part of the French took their boat and rowed aboard their ship to fetch the commodities promised, and what else they pleased, but being entered, they were taken and bound. The Flemings on the land, when they had carried their Coffin into the Chappel, shut the door to them, and taking their weapons out of the Coffin Set upon the French: They run to the Cliff and cry to their Companions aboard the Fleming to come to their succor. But finding the boat charged with Flemings, yielded themselves and the Place."

In the reign of Elizabeth, Helier de Carteret, of Jersey, falsely representing Sark as being uninhabited, it was granted to him in fee, in consideration of services rendered the state. He settled on it, as his tenants, forty families from Jersey, so that the present population are mostly of Jersey origin. The Seigneurie has passed out of the De Carteret family, but the name is not uncommon, and the descendants in the direct line still occupy a substantial stone cottage, well overgrown with flowering shrubs and vines.

Politically, Sark belongs to the "Bailiwick of Guernsey," but it has, much in the same way that our States have, an independent legal existence. The local government is vested in an Assembly, consisting of the Seigneur and his forty tenants. He must be present at all meetings (three times a year), either in person or by deputy, and his approval is necessary to the validity of all ordinances. He alone receives all tithes,

getting the tenth sheaf of wheat, barley, oats, and peas; also the tenth of wool and lamb. His tenants, who hold the forty divisions of the island outside of the Seigneurie, are tenants by right of birth and purchase, — absolute owners under the laws of the island, but owing certain feudal obligations to their chief. The holdings are indivisible. No tenant can sell, or in any way dispose of a portion of his property. He may sell the whole, but in that case one thirteenth of the price goes to the lord. In case of death, the property all goes to the eldest son, or, in the absence of sons, to the eldest daughter, or to the next heir. In this way, all properties continue intact, as granted by the first De Carteret.

The Jersey system of agriculture prevails; the soil is said to be even more fertile than that of the larger islands. The dairy has little prominence, and the cows are inferior. Parsnips are very largely grown, and are much used for fattening oxen and swine. The supply of meat and grain to Guernsey is the principal source of money income to the farmer. Sea-weed is hardly less used than in the other islands, notwithstanding the difficulty of collecting it, and the enormous labor of hauling it up the steep road from the sea.

Formerly a silver-mine in Little Sark was actively worked, but it is now abandoned, and the industry of the island is confined exclusively to fishing and farming, and latterly to the supplying of a considerable number of visitors; of these there were in 1873 over four thousand.

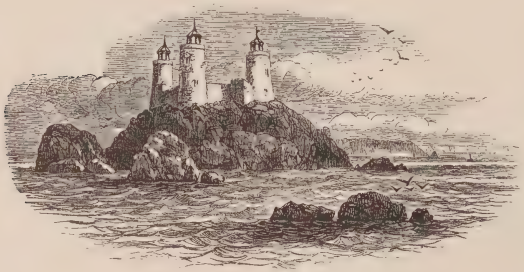
The language of the people is "Sarkais." It should be a dialect of the Jersey, but it has peculiarities which seem to ally it to the patois of Bearn and Gascony, — such as the use of *b* for *v* (*beux* for *veux*). To the stranger it has even a ruder sound than the dialects of the other islands.

As the day was closing, we climbed down the steep foot-path, and regained our boat, leaving Sark with the light of the rosy sunset on its western cliffs, and with the unfading light of the rosiest memories settled forever on its image in our minds.

We had a charming moonlight sail back to St. Peter Port, and during

TWO "CHASSE-MARÉES."

the rest of our stay in Guernsey the clean-cut outline of the enchanted island remained unclouded before our window. The sea kept its unrippled stillness, and we had the unspeakable satisfaction of glassy smooth water for our trip to Southampton, — not a frequent experience on this journey. At the three-towered Casquets we bade good by to the material presence of the Channel Islands; but, once known, they remain bright in the recollection for many a long day, inviting to renewed acquaintance, in a degree equalled by few other places.



THE CASQUETS.

CHAPTER VIII.

THE CLIMATE OF THE CHANNEL ISLANDS.

SINCE the first publication of the foregoing papers, I have been frequently asked about the climate of the Channel Islands, with reference to the residence of invalids. The following additional information, from Mr. Ansted's elaborate work, is therefore appended: —

Mean Results of Observations extending over sixteen years, from January 1, 1843, *to December* 31, 1858. By S. Elliott Haskins, M. D., F. R. S., F. R. C. P., Member of the British Meteorological Society.

Latitude of station, 49° 27½′ N. Longitude, 2° 32′ W. Height of station above mean sea-level, 204 feet.

Observations.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mean of 12 Months
Mean Temperature of Air, Corrected	43.6	42.5	43.5	47.4	52.0	57.8	61.0	61.1	58.8	54.0	48.7	46.5	51.6
Mean Temperature of Dew Point	39.3	37.9	38.8	42.4	46.0	51.6	55.1	54.6	53.6	49.2	43.7	40.7	46.1
Highest Readings of Thermometer	54.5	56.0	61.5	66.0	73.0	80.0	83.5	79.0	76.0	70.5	62.0	59.0	83.5
Lowest Readings of Thermometer	24.5	27.0	27.0	34.0	39.0	44.0	50.0	50.5	48 0	41.0	30.5	29.0	24.5
Mean Monthly Range of Temperature	20.5	19.6	21.8	22.6	24.8	25.4	22.2	20.3	20.1	20.4	19.7	20.1	21.4
Mean Daily Range of Temperature	6.4	7.1	7.8	9.3	10.5	11.6	10.7	10.0	8.5	6.7	6.1	6.2	8.1
Amount of Rain collected	3.844	2.362	2.238	2.513	2.231	2.100	2.339	2.032	2.711	5.082	3.788	3.526	34.766
Number of Days of Rain, Hail, and Snow	18.3	13.6	13.5	13.4	10.5	10.0	10.8	10.8	11.2	18.0	16.8	17.5	164.5

"Whilst the temperature of the year in Guernsey is only two and a half degrees above that of Greenwich (London), it appears that the autumn temperature is four degrees, and the winter as much as six degrees warmer. On the other hand, there is only a difference of one degree in the spring months, and the summer months are more than half a degree cooler in the island than in the southeast of England."

The following is the comparison of the winter temperature by months: —

	Greenwich.	Guernsey.	Difference in favor of Guernsey.
November	43.2°	48.7°	5.5°
December	39.3	46.5	7.2
January	36.6	43.6	7.0
February	38.6	42.5	3.9
March	41.4	43.5	2.1
April	46.2	47.4	1.2

"It will be seen that the temperature of November at Greenwich corresponds with that of January in Guernsey, while November at Guernsey differs but little from October at Greenwich. . . . . Combining the observations of mean temperature and comparing Guernsey with Greenwich, we see, therefore, that in Guernsey the spring is a little warmer than in England, and the summer rather cooler. In Guernsey, however, the temperature of July and August continues, with little change, into September and October, the summer and autumn differing little, and the latter extending into the months which in England are regarded as midwinter. Winter may, therefore, be said to be altogether absent as a season in Guernsey; but on the other hand the spring is cold and late."

However, as a sanitary question the daily range of the thermometer is really of more consequence than is the mean temperature of whole seasons. Ansted says: "In Guernsey this range is so small as to be altogether exceptional among northern climates. While at Greenwich, as shown from an average of ten years, the mean daily range is 16.2°, in Guernsey it is exactly one half, or 8.1°. In this, however, as in the temperature, it is not so much the annual average, as the distribution of the averages, that is significant. The following tabular statement of the mean daily range of each month will point out the essential facts: —

	Greenwich.	Guernsey.		Greenwich.	Guernsey.
April	19.1°	9.3°	October	14.6°	6.7°
May	20.2	10.5	November	11.7	6.1
June	20.8	11.6	December	9.5	6.2
July	21.3	10.7	January	10.0	6.4
August	20.0	10.0	February	12.3	7.1
September	19.8	8.5	March	15.2	7.8

"The difference of climate thus indicated is total. . . . . The days of summer are not very hot, but the nights are comparatively warm, and there is hardly any chill in the night-air at any time of the year. On the other hand, the days of spring are uniformly cold; the summer does not commence early, and in the summer days the heat is rarely extreme. . . . . The absolute maxima and minima recorded are very much below those of any part of England or France.*

"A long series of observations is required for accurate comparison, but we may safely state that there is no recorded climate, and probably no climate whatever, in north temperate latitudes on either side of the Atlantic, that presents so small a daily range of the thermometer as the Island of Guernsey. . . . . It appears from careful observation that, in spite of the low temperature of the Guernsey spring months, many kinds of flowering plants and shrubs are at least a fortnight earlier there than even in the warmer parts of England; and in face of the fact that the summer is cooler than at Greenwich, the ripening of fruit in the open air during July, August, and September is some days earlier in Guernsey.

"Although the rain is considerable, the climate of Guernsey is certainly not inconvenient from wetness. During the wet months the continuance of more than twelve hours' rain is very rare; and in summer, and indeed at all other times, it rarely happens that a wet morning is not succeeded by a bright evening. On the other hand, a brilliant morning is rarely the precursor of a beautiful afternoon.

"A clouded state of the atmosphere prevails with remarkable uniformity throughout the year. Estimating a completely concealed sky at 10, the mean cloudiness of the year is about $5\frac{1}{2}$. April, June, July, and September are slightly clearer than the mean, and October, November, and January about as much cloudier. September is the clearest and January the cloudiest month. Notwithstanding this tabulated result, it must not be supposed that there is any want of bright sunshine in Guernsey. The fact seems to be that changes are frequent, and occasional cloud common, while continued obscuration is rare.

* Meaning, obviously, that the maxima are below and the minima *above* those of the other countries. Probably the comparison is not intended to cover the Mediterranean shore of France.

"Snow rarely falls in this island, and still more rarely lies on the ground more than a few hours.

"Guernsey is uniformly more cloudy than Jersey, the only exceptions being the months of February and December. In the former the difference would seem to be pretty uniformly the other way. In the latter month, and in January, the difference is too small to have significance.

"As the sky is more frequently clouded in Guernsey than in Jersey, so the number of days of rain-fall is greater, and the quantity of rain that falls decidedly larger. During the six years of the joint record (from the 1st of July, 1850, to the 30th of June, 1855), there were in all 909 days during which rain fell in Jersey, and 931 in Guernsey; while the quantity of rain that fell was in the one island 188.6 inches, and in the other 207.7. The seasons may conveniently be divided into the wet, the medium, and the dry. The wet months are from October to January inclusive, — October being very much the wettest in both islands. The average rain-fall of this month in each island during the years of record was 5.7 inches, the maximum being in 1852, when no less than 8.2 inches fell in Jersey. Very nearly as much (7.9 inches) fell in the October of 1854, while in each year the fall in Guernsey was .7 inches less. November and January are less wet than October, the rain-fall during each of those months in both islands being nearly the same. In December the quantity of rain is considerably less than in November and January, but the number of days of rain-fall almost as large. So far as these months are concerned, the rain-fall is almost invariably heavier in Guernsey than in Jersey, as might indeed have been expected, since rain generally comes from westerly winds, and these deposit their moisture on the land they first approach. On the setting in of cold in Europe, after the close of autumn, it would seem inevitable that Guernsey should receive more rain than Jersey. It does so, as is evident from the tabulated results.

"The month of September (preceding the autumnal equinox) is comparatively a wet month in Guernsey, but not in Jersey. The number of days of rain-fall is then about the same in each island, but the quantity of rain is one third less in Jersey. The month of March, however (pre-

ceding the vernal equinox), exhibits the same amount of rain-fall in the two islands, and this amount scarcely differs from that of September in Jersey, namely, 2.1 inches. May, June, and August are wetter than March, the average being $2\frac{1}{2}$ inches in Guernsey and about three tenths of an inch less in Jersey; but here again there is a difference observable, May and June being nearly alike in the two islands, and August much dryer than either of them in Jersey, although equally wet in Guernsey.

"February, April, and July are dry months in both islands, the average rain-fall being nearly the same; but February and April are equally dry in Jersey, and February much the dryest in Guernsey. The months in which rain falls during the smallest number of days are April, August, and September in Guernsey, and April and September in Jersey; . . . . heavier rain falls occasionally in Jersey, but more rain falls during the year and it falls on a larger number of days in Guernsey. In all these points we see that the insular character of the climate is much more strongly marked in Guernsey than in Jersey."

There are two reasons why Mr. Ansted has given so much more attention to the climate of Guernsey than to that of Jersey: first, that he was for some years a resident of Guernsey; and second, that very accurate meteorological records were kept for a long series of years in Guernsey, while none sufficiently accurate for scientific purposes were kept during the same period in Jersey. From my own limited means of information, I should say that there is no essential difference, so far as the residence of invalids is concerned, between the two islands, and that either would be decidedly favorable for persons suffering from pulmonary weakness.

POST SCRIPTUM.

October, 1875.

Having occasion to make a second visit to Amsterdam, and being much favored by the weather, — it had poured in torrents for some days, so that all the draining wind-mills in Holland were straining their broad sails to make head against the growing flood, — I had an opportunity to see the great pumping-engine (the Lijnden, which I had examined at rest two years before) in full work.

Mr. van der Poll, the Dijkgraaf, kindly drove us from the station to the engine at Halfway, where the six paddle-wheels were slowly, but steadily and forcibly, thrusting the tide of the encircling canal through the sluice-gates into the IJ. Thence we went to the Lijnden, which, before we came in sight, announced itself by long, slow aspirations, as of some mighty monster of the deep. As we drew near we saw the ponderous working-beams slowly and smoothly rising and falling, as though gently waving an adieu to the waters of the polder. Even as we walked around the outer gallery, and saw seven of the pumps discharging, seven times per minute, each one its eight tons of water on to the spilling-floor, there was no more apparent effort or strain than in the dipping of spoonfuls from a wineglass.

The great pistons and the enormous load of ballast were raised by the direct pressure of the steam, and in their fall, aided by the expansion against the top of the annular piston, they raised the plungers with their burden of water.

It would be useless to attempt, by description or by computation, to give the reader the impression which this vast artificial flood produces on one who sees it for the first time. The stream as it flows from the spilling-floor to the canal is too deep and too broad to be very turbulent; but the seven columns of water, more than five feet in diameter and ten feet high, rising at such rapid intervals, convert the whole chamber above the floor into a foaming torrent which is vastly impressive from the depth and force of its universal

movement, the water boiling and tumbling as in a seething caldron over Titanic fires. The Dijkgraaf, wishing to give us a yet clearer idea of the capacity of the pumps, caused the gates to be closed, emptying the chamber back into the lake. And then the work began anew. As the contents of the seven pumps at the first stroke discharged themselves over the spilling-floor, and as volume after volume was added to the mass, there was a more obvious demonstration of the gigantic capacity of the machinery than we could have received in any other way. As the water rose to the level of that in the encircling canal, the sluice-gates hung for a moment in the balance, and with the next stroke of the pumps slowly swung back on their hinges, giving outlet to the flood whose uninterrupted movement for so many months was needed for the draining of the Haarlem Lake. I thought that I had realized before the enormous meaning of this work; but, seeing the actual movement of the machinery and the torrent, I found that imagination had been entirely powerless to compass the stupendous fact.

From the Lijnden we drove some miles over the well-made roads at the bed of the lake, passed through one of its busy villages, and later through the beautiful suburbs of Haarlem, whence we went to Leyden and to the charming château d'Endegeest for a pleasant hour with Mr. Gevers, now eighty-three years of age and still happy and enthusiastic over the success of the work, in the execution of which, as President of the Commission, he bore so important a part.

For want of time I could not inspect the work on the North Sea Canal, but it is progressing rapidly, and it is probable that within a year the IJ will all be drained, and the canal ready for the passage of small vessels.

The drainage of the Zuyder Zee is still under discussion as to its details, but it seems a foregone conclusion that the work cannot be much longer delayed. Mr. Amersfoort is now preparing models to illustrate this project for exhibition at Philadelphia next year.

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